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Docket No.: SON-2050  
(PATENT)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of:  
Hisao Hayashi

Application No.: 09/808,957

Confirmation No.: 5303

Filed: March 16, 2001

Art Unit: 2822

For: THIN FILM SEMICONDUCTOR DEVICE  
AND MANUFACTURING METHOD  
THEREOF

Examiner: M. Lewis

**APPELLANT'S BRIEF**

MS Appeal Brief - Patents  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

**INTRODUCTORY COMMENTS**

This is an Appeal Brief under 37 C.F.R. §41.37 appealing the final decision of the Examiner dated July 28, 2004. Each of the topics required by 37 C.F.R. §41.37 is presented herewith and is labeled appropriately.

This brief is in furtherance of the Final Office Action on July 28, 2004.

A Notice of Appeal was filed in this case on November 29, 2004.

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**I. REAL PARTY IN INTEREST**

Sony Corporation of Tokyo, Japan ("Sony") is the real party in interest of the present application. An assignment of all rights in the present application to Sony was executed by the inventor and recorded by the U.S. Patent and Trademark Office at **reel 011631, frame 0804**.

**II. RELATED APPEALS AND INTERFERENCES**

There are no other appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

**III. STATUS OF CLAIMS**

Claims 1-21 (canceled);

Claims 22-28 (rejected);

Claims 29-30 (canceled);

Claims 31-37 (rejected);

Claims 38-39 (canceled);

Claims 40-46 (rejected);

Claims 47-48 (canceled);

Claims 49-52 (rejected).

#### **IV. STATUS OF AMENDMENTS**

Subsequent to the final rejection of July 28, 2004, an Amendment After Final Action (37 CFR Section 1.116) has been filed on August 24, 2004.

The Advisory Action of September 22, 2004 indicated that the Amendment After Final Rejection Under 37 C.F.R. § 1.116 of August 24, 2004 would not be entered for the purposes of appeal.

Subsequent to the final rejection of July 28, 2004, an Amendment After Final Action (37 CFR Section 1.116) has been filed on October 22, 2004.

The Advisory Action of November 23, 2004 indicated that the Amendment After Final Rejection Under 37 C.F.R. § 1.116 of October 22, 2004 would be entered for the purposes of appeal.

#### **V. SUMMARY OF CLAIMED SUBJECT MATTER**

Disclosed is a product that includes the features of a product substrate (1) and a thin film device (3). A manufacturing substrate (20) is of an inorganic material (substitute specification at page 6, line 3). The product substrate (1) is one of an organic material and a metal (substitute specification at page 6, lines 3-4 and 23-26).

The product substrate (1) has a first side and a second side opposed to the first side (substitute specification at figure 1A), wherein the manufacturing substrate (20) is adjacent the first side, the manufacturing substrate (20) being closer to the first side than to the second side.

An adhesive layer (21) is formed between the first side and the manufacturing substrate (20) (substitute specification at figure 1A, page 6, line 29 to page 7, line 2), wherein the thin film device (3) is adjacent the second side, the thin film device being closer to the second side than to the first side (substitute specification at figures 1B, 3), and the product

substrate is between the thin film device and the manufacturing substrate (substitute specification at figures 1B, 3).

In addition, the manufacturing substrate is removable for exposing the first side by leaving the product substrate and the thin film device (substitute specification at figure 2, page 6, line 29 to page 7, line 2).

## **VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL**

The issues presented for consideration in this appeal are as follows:

Whether the Examiner erred in rejecting claims 22, 24-26, 32, 34-35, 41, 43-44 and 50-52 under 35 U.S.C. §103 as allegedly being obvious over U.S. Patent No. 5,376,561 to Vu et al. (Vu) in view of Japanese Publication No. 11-265155 (Toshiba);

Whether the Examiner erred in rejecting claims 23, 33 and 42 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and U.S. Patent No. 6,049,106 to Forbes;

Whether the Examiner erred in rejecting claims 27, 36 and 45 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and U.S. Patent No. 6,057,234 to Yamazaki;

Whether the Examiner erred in rejecting claims 28, 37, and 46 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and U.S. Patent App. No. 2002/0164535 to Hoffend, Jr. et al. (Hoffend);

Whether the Examiner erred in rejecting claims 31, 40 and 49 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and U.S. Patent No. 6,458,613 to Bae.



These issues will be discussed hereinbelow.

## VII. ARGUMENT

In the Final Office Action of July 28, 2004:

The Examiner erred in rejecting claims 22, 24-26, 32, 34-35, 41, 43-44 and 50-52 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba;

The Examiner erred in rejecting claims 23, 33 and 42 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and Forbes;

The Examiner erred in rejecting claims 27, 36 and 45 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and Yamazaki;

The Examiner erred in rejecting claims 28, 37, and 46 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and Hoffend;

The Examiner erred in rejecting claims 31, 40 and 49 under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and Bae.

For at least the following reasons, Appellant submits that these rejections are both technically and legally unsound and should therefore be reversed.

### General issues

The following general issues are not the subject for the appeal, but are provided only for the purposes of completeness.

Please note that the Final Office Action of July 28, 2004 is the third Final Office Action and the fifth Office Action overall on the merits, resulting in costly prosecution delays.

A prompt conclusion of the prosecution resulting in the allowance of the claims would be greatly appreciated.

It is noted that no indication of acceptance of the drawings filed on March 16, 2001 has been provided in box 10 of the Final Office Action Summary (PTOL-326). Acknowledgement of acceptance of the drawings filed on March 16, 2001 is respectfully requested.

Please acknowledge receipt of the reline copy and clean copy of the substitute specification filed on July 3, 2002. Acknowledgement of entry of the substitute specification is also respectfully requested.

Grouping of claims

Claims 22-28, 31-37, 40-46 and 49-52 are currently pending and finally rejected in this application, with claims 22, 32 and 41 being independent. For purposes of the issues presented by this appeal:

Claims 22, 24-26, 32, 34-35, 41, and 43-44 stand or fall together.

Claims 23, 33 and 42 stand or fall together.

Claims 27, 36 and 45 stand or fall together.

Claims 28, 37, and 46 stand or fall together.

Claims 31, 40 and 49 stand or fall together.

Claims 50-52 stand or fall together.

The arguments set forth in the following section provide reasons why these claims are considered patentable, 37 C.F.R. §41.37(c)(1)(vii).

Rejection under 35 U.S.C. §103

“The Patent and Trademark Office (PTO) has the burden of showing a prima facie case of obviousness.” *In re Bell*, 991 F.2d 781, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993). “In determining the propriety of the Patent Office case for prima facie obviousness, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the proposed substitution or other modification.” *In re Taborsky*, 502 F.2d 775, 780-81, 183 USPQ 50, 55 (CCPA 1974). Moreover, *prima facie* obviousness of a claimed invention is established “only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.” *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

For purposes of this appeal brief only, and without conceding the teachings of any prior art reference, the claims:

Claims 22, 24-26, 32, 34-35, 41, 43-44 and 50-52 were rejected under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba.

Claims 22, 24-26, 32, 34-35, 41, 43-44

This rejection of these claims is traversed at least for the following reasons.

Independent claim 22 includes the features of:

a product substrate and a thin film device,

wherein a manufacturing substrate is of an inorganic material,

wherein said product substrate is one of an organic material and a metal,

wherein said product substrate has a first side and a second side opposed to said first side,

wherein said manufacturing substrate is adjacent said first side, said manufacturing substrate being closer to said first side than to said second side,

wherein an adhesive layer is formed between said first side and said manufacturing substrate,

wherein said thin film device is adjacent said second side, said thin film device being closer to said second side than to said first side,

wherein said product substrate is between said thin film device and said manufacturing substrate, and

wherein said manufacturing substrate is removable for exposing said first side by leaving said product substrate and said thin film device.

Independent claim 32 includes the features of:

a product substrate and a pixel array,

wherein a manufacturing substrate is of an inorganic material,

wherein said product substrate is one of an organic material and a metal,

wherein said product substrate has a first side and a second side opposed to said first side,

wherein said manufacturing substrate is adjacent said first side, said manufacturing substrate being closer to said first side than to said second side,

wherein an adhesive layer is formed between said first side and said manufacturing substrate,

wherein said pixel array is adjacent said second side, said pixel array being closer to said second side than to said first side,

wherein said product substrate is between said pixel array and said manufacturing substrate, and

wherein said manufacturing substrate is removable for exposing said first side by leaving said product substrate and said pixel array.

Independent claim 41 includes the features of:

a product substrate and an electroluminescence device,

wherein a manufacturing substrate is of an inorganic material,

wherein said product substrate is one of an organic material and a metal,

wherein said product substrate has a first side and a second side opposed to said first side,

wherein said manufacturing substrate is adjacent said first side, said manufacturing substrate being closer to said first side than to said second side,

wherein said electroluminescence device is adjacent said second side, said electroluminescence device being closer to said second side than to said first side,

wherein an adhesive layer is formed between said first side and said manufacturing substrate,

wherein said product substrate is between said electroluminescence device and said manufacturing substrate, and

wherein said manufacturing substrate is removable for exposing said first side by leaving said product substrate and said electroluminescence device.

The Final Office Action alleges that Vu teaches a product substrate (36), a thin film device, a manufacturing substrate (30), and adhesive layer (34) (Vu at figure 4I).

However, Vu arguably teaches the alleged product substrate (36) to be a silicon oxy-nitride ( $\text{SiO}_x\text{N}_y$ ) release layer, comprising a mixture of silicon nitride ( $\text{Si}_3\text{N}_4$ ) and silicon dioxide ( $\text{SiO}_2$ ) may be a suitable choice (Vu at column 7, lines 1-7). Accordingly, the Final Office Action admits that the alleged product substrate (36) being comprised of an organic material and a metal *is not* found within Vu (Final Office Action at page 3).

To account for this admitted deficiency within Vu, the Final Office Action further contends that it would have been obvious to the skilled artisan to modify the semiconductor device of Vu to include the use of an organic material and a metal coated on a substrate as disclosed in Toshiba because it aids in stabilizing the display (Final Office Action at page 3).

In response to this contention, please note that the assertion found within the Final Office Action of *a substrate comprised of an organic material and a metal* fails to accurately represent the language found within the claims. Specifically, the claimed invention provides that the *product substrate is one of an organic material and a metal*.

“For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995). In this regard, the specification discloses a product substrate 1 made of an *organic material* (substitute

specification at page 6, lines 1-2). The specification alternatively discloses the use of a *metal plate* for the product substrate 1 (substitute specification at page 6, lines 19-24). Whereas the product substrate of the claimed invention can include an organic material or a metal, as shown hereinabove, it is not required within the claims for the product substrate to comprise both an organic material and a metal.

The Advisory Action of November 23, 2004 acknowledges that the claim 22 substrate comprises either an organic material or a metal. In response to this acknowledgment, while the claim 22 substrate may comprise either an organic material or a metal, a requirement for the claim 22 substrate to comprise both an organic material and a metal is not found within that claim.

Moreover, *prima facie* obviousness of a claimed invention is established “only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references.” *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). There are three possible sources for a motivation to combine references: 1) the nature of the problem to be solved, 2) the teachings of the prior art, and 3) the knowledge of persons of ordinary skill in the art. *In re Rouffet*, 149 F.3d 1350, 1358, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998).

Regarding the teachings of Toshiba, that reference arguably teaches substrate (11) as a product substrate of an organic material such as a plastic (Toshiba at figure 5, Abstract), wherein a thin film transistor (23) and pixel electrode 24 are adjacent the substrate (11) (Toshiba at figure 5). Toshiba arguably teaches an aluminum film 12 on the plastic substrate (11) (Toshiba at figure 4(a)).

Vu arguably teaches substrate (110) as a substrate of an organic material such as a plastic (Vu at figure 5A, column 8, lines 65-66), wherein a thin film transistor 51 and pixel electrode 62 are adjacent the substrate (110) (Vu at figure 5A).

Arguably, substrate (110) of Vu is comparable with substrate (11) of Toshiba, thin film transistor 51 of Vu is comparable with thin film transistor (23) of Toshiba, and pixel electrode 62 of Vu is comparable with and pixel electrode 24 of Toshiba.

But notwithstanding the presence of substrate (110) of Vu, which may arguably be a product substrate of plastic, and notwithstanding presence of substrate (11) of Toshiba, which may arguably be a product substrate of plastic, the Final Office Action inexplicably attempts to associate a nitride release layer (36) of Vu (Vu at column 8, line 12) with the plastic substrate (11) of Toshiba.

In particular, the Final Office Action fails to show that the release layer (36) of Vu is considered in the art to be suitable for the purpose of a product substrate, especially considering that the release layer (36) is ultimately removed from the device of Vu (Vu at column 8, line 38). In addition, the Final Office Action fails to show that the plastic substrate (11) of Toshiba is a suitable replacement for the nitride layer (36) of Vu, especially taking into consideration the presence within Vu of the plastic substrate (110) (Vu at figure 5A).

The Final Office Action asserts that the skilled artisan would have replaced the release layer (36) of Vu with the plastic substrate (11) of Toshiba. Yet, it is unclear within the Final Office Action as to whether or not the plastic substrate (11) shown within figure 5 Toshiba is intended to co-exist along with the plastic substrate (110) shown within figure 5A of Vu, or if the plastic substrate (11) shown within figure 5 Toshiba is intended to replace the plastic substrate (110) shown within figure 5A of Vu, or if the plastic substrate (11) shown within figure 5 Toshiba is intended to replace the nitride release layer shown within figure 4H of Vu.

Even still, that Vu might incorporate the plastic substrate (11) of Toshiba does not render the claims obvious when there is no suggestion of using the plastic substrate (11) of Toshiba in substantially the same manner as nitride layer (36) of Vu. See, for example, *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) and M.P.E.P. §2143.01, section “*The Proposed Modification Cannot Change The Principle Of Operation Of A Reference.*”

Thus, the Final Office Action fails to show why the skilled artisan would have been motivated to replace the nitride layer (36) of Vu with the plastic substrate (11) of Toshiba.



The Advisory Action of November 23, 2004 refers to the specification, contending that the specification and abstract for the above-identified application provides that the substrate has a characteristic suitable for direct mounting of the thin film transistor.

In response, the Advisory Action makes reference to the specification and abstract found within the above-identified application in an attempt to fill in the gaps identified hereinabove with respect to the combination of Vu and Toshiba.

But as a rule, "it is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. The references themselves must provide some teaching whereby the applicant's combination would have been obvious" (citations omitted). *In re Gorman*, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). See also *In re Dembiczak*, 50 USPQ2d 1614, 1616 (Fed. Cir. 1999)(rejection based upon hindsight is reversed).

Please note that the Advisory Action attempts to highlight passages directly from within Applicants specification and while failing to highlight specific teachings within the cited prior art. Thus, the Advisory Action impermissibly engages in hindsight reconstruction by using the applicant's disclosure as a template to fill the gaps identified hereinabove with respect to the combination of Vu and Toshiba.

The prior art as a whole does not render Applicant's invention obvious because the teachings in the prior art are insufficient to suggest making the proposed substitution or other modification to Vu or Toshiba.

The Advisory Action further contends that the release layer (36) of Vu is a product substrate because a transistor is mounted upon it, and that the substrate (11) of Toshiba is a product substrate because a transistor is mounted upon it. Therefore, the substrates are suitable replacement.

In response to this contention, the teachings of Vu and Toshiba fail teach the plastic substrate (11) of Toshiba as a replacement for the nitride release layer (36) of Vu at least for the following reasons.

Specifically, Toshiba arguably teaches the presence of a plastic substrate (11) wherein the plastic can be acrylic resin, polyester, or allylic resin (Toshiba at paragraph [0015]). Toshiba arguably teaches amorphous silicon or polycrystalline silicon that is deposited on an  $\text{Al}_2\text{O}_3$  film 16 (Toshiba at figure 5, paragraph [0047]). Toshiba is silent as to a recrystallization of the amorphous silicon or polycrystalline silicon.

Figure 4A of Vu arguably teaches an Isolated Silicon Epitaxy (ISE) silicon-on-insulator (SOI) having a single crystal silicon layer (38) on the nitride release layer (36) (Vu at column 6, lines 58-62 and column 7, lines 8-9). For the case of ISE SOI structures, the top layer is essentially single-crystal recrystallized silicon, from which CMOS circuits can be fabricated (Vu at column 7, lines 11-13).

However, Vu and Toshiba, either individually or in combination, fails to disclose, teach or suggest that the plastic described within Toshiba, if substituted within figure 4A of Vu for the nitride layer (36), would be capable of withstanding processing that is associated with the recrystallization of silicon layer (38).

Vu arguably teaches that the nitride layer (36) etches faster in HF than oxide layer (34) (Vu at column 8, lines 11-13).

However, Vu and Toshiba, either individually or in combination, fails to disclose, teach or suggest that the plastic described within Toshiba, if substituted within figure 4A of Vu for the nitride layer (36), would etch faster in HF than oxide layer (34) of Vu.

To form the final display panel of Vu, the edges of the carrier (80) are trimmed to coincide with the tile borders, and the nitride release layer (36) is removed by etching (Vu at figure 5A, column 8, lines 36-38).

However, Vu and Toshiba, either individually or in combination, fails to disclose, teach or suggest that the plastic described within Toshiba, if substituted within figure 4A of Vu

for the nitride layer (36), would be removed by etching to form the final display panel. In this regard, it has been previously noted herein that the final panel of Vu may contain a plastic substrate (110) (Vu at figure 5B).

As shown above, there is no suggestion of using the plastic substrate (11) of Toshiba in substantially the same manner as nitride layer (36) of Vu. Further clarification regarding the contentions made within the Final Office Action and the Advisory Action of November 23, 2004 that the substrate (11) of Toshiba is suitable replacement for the release layer (36) of Vu is respectfully requested.

#### Claims 50-52

This rejection of these claims is traversed at least for the reasons provided hereinabove with respect to claims 22, 24-26, 32, 34-35, 41, 43-44 and for the following reasons.

The Final Office Action contends that the claimed feature of an adhesive layer being dissolvable to remove the manufacturing substrate makes that feature a product-by-process feature.

In response to this contention, the adhesive layer being dissolvable to remove the manufacturing substrate *is a structural feature of the adhesive layer*. However, the Final Office Action attempts to recast selected structural features found within the claims as process steps. Such a reconstruction is merely an attempt to redefine the invention in a manner different than from what is set forth within the claims. Such reconstruction is without authority under Title 35 U.S.C., Title 37 C.F.R., the M.P.E.P. and relevant case law; such reconstruction is therefore deemed improper.

Moreover, a "product-by-process" claim is one in which the product is defined at least in part in terms of the method or process by which it is made. *Atlantic Thermoplastics Co. Inc. v. Faytex Corp.*, 970 F.2d 834, 23 USPQ2d 1481 (Fed. Cir. 1992). However, the adhesive layer being dissolvable to remove the manufacturing substrate is not a process step, but instead, is physical characteristic of the adhesive layer. Physical characteristics are not process steps.

Exclusion of any claimed feature from consideration is also deemed improper. *In re Lowry*, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994)(Board erred by denying patentable weight to data structure limitations). As a result, the mischaracterization of this feature of *the adhesive layer being dissolvable to remove the manufacturing substrate* as product-by-process feature, along with an exclusion of this feature from consideration, is improper.

The Advisory Action of November 23, 2004 provides that the adhesive layer being dissolvable to remove the manufacturing substrate is a structural feature so far as the layer must be removed. Accordingly, the Advisory Action admits that the adhesive layer being dissolvable to remove the manufacturing substrate is a structural feature.

The Advisory Action of November 23, 2004 further provides that the method by which adhesive layer is removed is a process limitation. In response, the Final Office Action and the Advisory Action of November 23, 2004 has failed to specifically identify any claims within the above-identified application that are drawn to a method by which the adhesive layer is removed.

Claims 23, 33 and 42 were rejected under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and Forbes.

This rejection of these claims is traversed at least for the reasons provided hereinabove with respect to claims 22, 24-26, 32, 34-35, 41, 43-44 and for the following reasons.

Within claims 23, 33 and 42, the manufacturing substrate is a glass substrate.

Within Forbes, the term "substrate" is to be understood as including silicon-on-insulator (SOI) or silicon-on-sapphire (SOS) technology, glass, quartz, silicon dioxide, other silicon-containing foundations, and other insulating structures (Forbes at column 2, lines 57-60). Forbes arguably teaches a thin film transistor (20) formed on substrate (22) (Forbes at figure 1, column 3, lines 4-5).

But recall, the Final Office Action cites element (30) of Vu as the manufacturing substrate (30) (Office Action at page 2), and contends that the manufacturing substrate (30) is removable for exposing the first side of the product substrate by leaving the product substrate and the thin film device.

However, Forbes fails to disclose, teach or suggest that the substrate (22) as removable for exposing the first side of a product substrate by leaving the product substrate and the thin film device (20). Instead, Forbes depicts the thin film device (20) on the substrate (22), while failing to show the removability of the substrate (22) from the thin film device (20).

Thus, Vu, Toshiba and Forbes, either individually or as a whole, fail to show why the skilled artisan would have been motivated to modify the teachings of Vu using the invention of Forbes.

Claims 27, 36 and 45 were rejected under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and Yamazaki.

This rejection of these claims is traversed at least for the reasons provided hereinabove with respect to claims 22, 24-26, 32, 34-35, 41, 43-44 and for the following reasons.

Within claim 27, a moisture-proof buffer film is formed between the second surface and the thin film device. Within claim 36, a moisture-proof buffer film is formed between the second surface and the pixel array. Within claim 45, a moisture-proof buffer film is formed between the second surface and the electroluminescence device.

Figure 3(A) of Yamazaki arguably depicts a silicon oxynitride film, a silicon oxide film or silicon nitride film acting as a buffer film (302) is deposited on substrate (301) (Yamazaki at column 7, lines 66-67). However, Yamazaki teaches substrate (301) as a glass substrate (301) (Yamazaki at column 7, line 65).

But within independent claims 22, 32 and 41, the product substrate is one of an organic material and a metal, the product substrate has a first side and a second side opposed to the first side, and the manufacturing substrate is adjacent the first side.

Yamazaki arguably teaches a method for fabricating a semiconductor device. Nevertheless, an adhesive layer formed between the first side and a manufacturing substrate, and the manufacturing substrate that is removable for exposing the first side by leaving the product substrate are not found within Yamazaki.

Furthermore, Yamazaki fails to disclose, teach or suggest a manufacturing substrate adjacent the first side of a product substrate, since only a single substrate (301) is depicted within Yamazaki.

In addition, Yamazaki fails to disclose, teach or suggest a product substrate that is one of an organic material and a metal. As a result, Yamazaki fails to disclose, teach or suggest the buffer film (302) formed between the second surface of a product substrate and a) a thin film device, b) a pixel array, or c) an electroluminescence device, wherein the product substrate that is one of an organic material and a metal.

Thus, Vu, Toshiba and Yamazaki, either individually or as a whole, fail to show why the skilled artisan would have been motivated to modify the teachings of Vu using the invention of Yamazaki.

Claims 28, 37, and 46 were rejected under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and Hoffend.

This rejection of these claims is traversed at least for the reasons provided hereinabove with respect to claims 22, 24-26, 32, 34-35, 41, 43-44 and for the following reasons.

Within claims 28, 37 and 46 the plastic for organic material of the product substrate is from the group comprising polyether sulfone resin, polyethylene terephthalate resin and ARTON resin.

Hoffend arguably teaches a thermal mass transfer donor element (100) that includes a donor substrate (110), a LTHC layer (112), a thermal transfer layer (114), and an interlayer (116) disposed between the LTHC layer and the thermal transfer layer (114) (Hoffend at figure 1a, paragraph [0021]). Donor element 102 includes a donor substrate (110), a light-to-heat conversion layer (LTHC) layer (112), and a thermal transfer layer (114) (Hoffend at figure 1b, paragraph [0021]). Donor element (104) includes a donor substrate (110), a LTHC layer (112), a thermal transfer layer (114), an interlayer (116) disposed between the LTHC layer and the thermal transfer layer, and an underlayer (118) disposed between the donor substrate and the LTHC layer (Hoffend at figure 1c, paragraph [0021]). Donor element (106) includes a donor substrate (110), a LTHC layer (112), a thermal transfer layer (114), and an underlayer (118) disposed between the donor substrate and the LTHC layer (114) (Hoffend at figure 1d, paragraph [0021]).

Nevertheless, an adhesive layer formed between the first side of the product substrate and a manufacturing substrate, and the manufacturing substrate that is removable for exposing the first side by leaving the product substrate are not found within Hoffend.

Hoffend arguably teaches an optional donor substrate (110) that can be a polymer film such as polyethylene terephthalate (Hoffend at paragraph [0033]). Hoffend arguably teaches receptor substrates suitable for use in displays such as *liquid crystal displays* or *emissive displays* that include rigid or flexible substrates that are substantially transmissive to visible light such as glass, indium tin oxide coated glass, low temperature polysilicon (LTPS), and *rigid plastic*. (Hoffend at paragraph [0071]). Hoffend arguably teaches that polymer substrates include a polyester base such as polyethylene terephthalate, polyethylene naphthalate (Hoffend at paragraph [0071]).

Yet, the Final Office Action fails to show why the skilled artisan would have been motivated to replace the nitride layer (36) of Vu with the receptor substrate of Hoffend.

Thus, Vu, Toshiba and Hoffend, either individually or as a whole, fail to show why the skilled artisan would have been motivated to modify the teachings of Vu using the invention of Hoffend.

Claims 31, 40 and 49 were rejected under 35 U.S.C. §103 as allegedly being obvious over Vu in view of Toshiba and Bae.

This rejection of these claims is traversed at least for the reasons provided hereinabove with respect to claims 22, 24-26, 32, 34-35, 41, 43-44 and for the following reasons.

Within claims 31, 40 and 49, the adhesive layer is from the group comprising a polyimide, Teflon resin, silicon, germanium and metal.

The Final Office Action cites element (34) of Vu for the adhesive found within the claims for the above-identified application. In this regard, Vu describes element (34) as an oxide layer such as SiO<sub>2</sub> (Vu at column 6, line 64). The Final Office Action admits that that Vu fails to disclose, teach or suggest element (34) as being an adhesive layer from the group comprising a polyimide, Teflon resin, silicon, germanium and metal (Office Action at page 9), and cites Bae for the features deficient within Vu.

Bae arguably teaches a method for manufacturing a liquid crystal display using a selective etching method. The Final Office Action cites layer (23) of Bae for the adhesive found within the claims for the above-identified application.

Bae arguably teaches that layer (23) has good adhesive property with amorphous silicon (Bae at column 1, lines 62-65). However, please note that Bae identifies layer (23) as being SiN<sub>x</sub> or SiO<sub>x</sub> layer (Bae at column 1, lines 62-63).

The Advisory Action mailed on September 22, 2004 contends that SiN<sub>x</sub> or SiO<sub>x</sub> reads *on the group comprising a polyimide, Teflon resin, silicon, germanium and metal* found within claims 31, 40 and 49 due to the transitional term “comprising” found within the preamble of independent claims 22, 32 and 41, and due to the presence of “silicon” within SiN<sub>x</sub> or SiO<sub>x</sub>.

In response to this contention, the use of SiN<sub>x</sub> or SiO<sub>x</sub> within Bae as the claimed adhesive layer is somewhat inconsistent with the assertions made within the Final Office Action in that the Final Office Action describes element (34) of Vu as an adhesive layer (Office Action



at page 3), in that Vu describes element (34) as an oxide layer such as  $\text{SiO}_2$ , in that the Final Office Action admits oxide layer (34) of Vu as failing to disclose, teach or suggest an adhesive layer from the group comprising a polyimide, Teflon resin, silicon, germanium and metal (Office Action at page 9), and in that the Final Office Action alternatively provides of  $\text{SiN}_x$  or  $\text{SiO}_x$  layer (23) of Bae for the adhesive layer notwithstanding the presence of  $\text{SiO}_2$  layer (34) of Vu.

Even more troubling with this contention is that layer (23) of Bae is used as a gate insulating layer for an inverted gate field effect transistor having a gate electrode (21) (Bae at figure 2a, column 1, lines 62-63). Please note that Toshiba also depicts a gate insulating layer 22 for an inverted gate field effect transistor (23) having a gate electrode (21) (Toshiba at figure 5). Additionally note that Vu depicts a gate insulating layer (48) (Vu at figure 4C) for a field effect transistor 51 having a gate electrode (50) (Vu at figure 4F).

But inexplicably, the Final Office Action attempts to associate a gate insulating layer (23) of Bae (Bae at figure 2a) with an oxide layer (34) of Vu (Vu at figure 4F), contending that the skilled artisan would have been motivated to replace the oxide layer (34) of Vu with the gate insulating layer (23) of Bae.

In addition, Bae arguably teaches that  $\text{SiN}_x$  or  $\text{SiO}_x$  layer (23) of Bae has a good adhesive property with an amorphous silicon (Bae at column 1, lines 63-65). However, the Final Office Action fails to show either a manufacturing substrate or a product substrate as amorphous silicon.

Like Vu and Toshiba, Bae fails to disclose, teach or suggest a product substrate having a first side and a second side opposed to the first side, wherein an adhesive layer is formed between the first side and the manufacturing substrate.

Thus, Vu, Toshiba and Bae, either individually or as a whole, fail to show why the skilled artisan would have been motivated to modify the teachings of Vu using the invention of Bae.

**Conclusion**

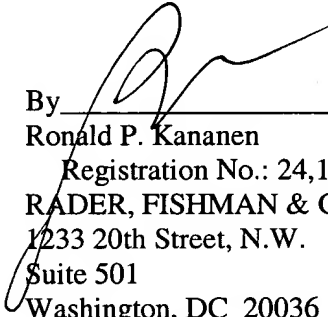
As shown hereinabove, Vu, Toshiba, Forbes, Yamazaki, Hoffend, and Bae, either individually or in combination, fail to disclose, teach or suggest all features of the claimed invention.

The claims are considered allowable for the same reasons discussed above, as well as for the additional features they recite.

Reversal of the Examiner's decision is respectfully requested.

Dated: January 31, 2005

Respectfully submitted,

By   
\_\_\_\_\_  
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**CLAIMS APPENDIX**

1-21. (canceled)

22. (previously presented) A thin film semiconductor device comprising:

a product substrate and a thin film device,

wherein a manufacturing substrate is of an inorganic material,

wherein said product substrate is one of an organic material and a metal,

wherein said product substrate has a first side and a second side opposed to said first side,

wherein said manufacturing substrate is adjacent said first side, said manufacturing substrate being closer to said first side than to said second side,

wherein an adhesive layer is formed between said first side and said manufacturing substrate,

wherein said thin film device is adjacent said second side, said thin film device being closer to said second side than to said first side,

wherein said product substrate is between said thin film device and said manufacturing substrate, and

wherein said manufacturing substrate is removable for exposing said first side by leaving said product substrate and said thin film device.

23. (previously presented) A thin film semiconductor device as claimed in claim 22, wherein said manufacturing substrate is a glass substrate.

24. (previously presented) A thin film semiconductor device as claimed in claim 22, wherein said thin film device is a thin film transistor.

25. (previously presented) A thin film semiconductor device as claimed in claim 22, wherein said metal is aluminum.

26. (previously presented) A thin film semiconductor device as claimed in claim 22, wherein said organic material is a plastic.

27. (previously presented) A thin film semiconductor device as claimed in claim 26, wherein a moisture-proof buffer film is formed between said second surface and said thin film device.

28. (previously presented) A thin film semiconductor device as claimed in claim 26, wherein said plastic is from the group comprising polyether sulfone resin, polyethylene terephthalate resin and ARTON resin.

29-30. (canceled)

31. (previously amended) A thin film semiconductor device as claimed in claim 22, wherein said adhesive layer is from the group comprising a polyimide, Teflon resin, silicon, germanium and metal.

32. (previously presented) A liquid crystal display device comprising:

a product substrate and a pixel array,

wherein a manufacturing substrate is of an inorganic material,

wherein said product substrate is one of an organic material and a metal,

wherein said product substrate has a first side and a second side opposed to said first side,

wherein said manufacturing substrate is adjacent said first side, said manufacturing substrate being closer to said first side than to said second side,

wherein an adhesive layer is formed between said first side and said manufacturing substrate,

wherein said pixel array is adjacent said second side, said pixel array being closer to said second side than to said first side,

wherein said product substrate is between said pixel array and said manufacturing substrate, and

wherein said manufacturing substrate is removable for exposing said first side by leaving said product substrate and said pixel array.

33. (previously presented) A liquid crystal display device as claimed in claim 32, wherein said manufacturing substrate is a glass substrate.

34. (previously presented) A liquid crystal display device as claimed in claim 32, wherein said metal is aluminum.

35. (previously presented) A liquid crystal display device as claimed in claim 32, wherein said organic material is a plastic.

36. (previously presented) A liquid crystal display device as claimed in claim 35, wherein a moisture-proof buffer film is formed between said second surface and said pixel array.

37. (previously presented) A liquid crystal display device as claimed in claim 35, wherein said plastic is from the group comprising polyether sulfone resin, polyethylene terephthalate resin and ARTON resin.

38-39. (canceled)

40. (previously amended) A liquid crystal display device as claimed in claim 32, wherein said adhesive layer is from the group comprising a polyimide, Teflon resin, silicon, germanium and metal.

41. (previously presented) A electroluminescence display device comprising:

a product substrate and an electroluminescence device,

wherein a manufacturing substrate is of an inorganic material,

wherein said product substrate is one of an organic material and a metal,

wherein said product substrate has a first side and a second side opposed to said first side,

wherein said manufacturing substrate is adjacent said first side, said manufacturing substrate being closer to said first side than to said second side,

wherein said electroluminescence device is adjacent said second side, said electroluminescence device being closer to said second side than to said first side,

wherein an adhesive layer is formed between said first side and said manufacturing substrate,

wherein said product substrate is between said electroluminescence device and said manufacturing substrate, and

wherein said manufacturing substrate is removable for exposing said first side by leaving said product substrate and said electroluminescence device.

42. (previously presented) A electroluminescence display device as claimed in claim 41, wherein said manufacturing substrate is a glass substrate.

43. (previously presented) A electroluminescence display device as claimed in claim 41, wherein said metal is aluminum.

44. (previously presented) A electroluminescence display device as claimed in claim 41, wherein said organic material is a plastic.

45. (previously presented) A electroluminescence display device as claimed in claim 44, wherein a moisture-proof buffer film is formed between said second surface and said electroluminescence device.

46. (previously presented) A electroluminescence display device as claimed in claim 44, wherein said plastic is from the group comprising polyether sulfone resin, polyethylene terephthalate resin and ARTON resin.

47-48. (canceled)

49. (previously amended) A electroluminescence display device as claimed in claim 41, wherein said adhesive layer is from the group comprising a polyimide, Teflon resin, silicon, germanium and metal.

50. (previously presented) A thin film semiconductor device as claimed in claim 22, wherein said adhesive layer is dissolvable to remove said manufacturing substrate.



51. (previously presented) A liquid crystal display device as claimed in claim 32, wherein said adhesive layer is dissolvable to remove said manufacturing substrate.

52. (previously presented) A electroluminescence display device as claimed in claim 41, wherein said adhesive layer is dissolvable to remove said manufacturing substrate.

## EVIDENCE APPENDIX

1. M.P.E.P. §2143.01, section “*The Proposed Modification Cannot Change The Principle Of Operation Of A Reference.*”
2. *In re Dembiczak*, 50 USPQ2d 1614, 1616 (Fed. Cir. 1999).
3. *In re Rouffet*, 149 F.3d 1350, 1358, 47 USPQ2d 1453, 1458 (Fed. Cir. 1998).
4. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir. 1995).
5. *In re Lowry*, 32 F.3d 1579, 32 USPQ2d 1031 (Fed. Cir. 1994).
6. *In re Bell*, 991 F.2d 781, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993).
7. *In re Fritch*, 972 F.2d 1260, 1266, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992).
8. *Atlantic Thermoplastics Co. Inc. v. Faytex Corp.*, 970 F.2d 834, 23 USPQ2d 1481 (Fed. Cir. 1992).
9. *In re Gorman*, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991).
10. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).
11. *In re Taborsky*, 502 F.2d 775, 780-81, 183 USPQ 50, 55 (CCPA 1974).

§ 2144.09 for examples of reasoning supporting obviousness rejections.

When the motivation to combine the teachings of the references is not immediately apparent, it is the duty of the examiner to explain why the combination of the teachings is proper. *Ex parte Skinner*, 2 USPQ2d 1788 (Bd. Pat. App. & Inter. 1986). A statement of a rejection that includes a large number of rejections must explain with reasonable specificity at least one rejection, otherwise the examiner procedurally fails to establish a *prima facie* case of obviousness. *Ex parte Blanc*, 13 USPQ2d 1383 (Bd. Pat. App. & Inter. 1989) (Rejection based on nine references which included at least 40 prior art rejections without explaining any one rejection with reasonable specificity was reversed as procedurally failing to establish a *prima facie* case of obviousness.).

If the examiner determines there is factual support for rejecting the claimed invention under 35 U.S.C. 103, the examiner must then consider any evidence supporting the patentability of the claimed invention, such as any evidence in the specification or any other evidence submitted by the applicant. The ultimate determination of patentability is based on the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments and any secondary evidence. *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). The legal standard of “a preponderance of evidence” requires the evidence to be more convincing than the evidence which is offered in opposition to it. With regard to rejections under 35 U.S.C. 103, the examiner must provide evidence which as a whole shows that the legal determination sought to be proved (i.e., the reference teachings establish a *prima facie* case of obviousness) is more probable than not.

When an applicant submits evidence, whether in the specification as originally filed or in reply to a rejection, the examiner must reconsider the patentability of the claimed invention. The decision on patentability must be made based upon consideration of all the evidence, including the evidence submitted by the examiner and the evidence submitted by the applicant. A decision to make or maintain a rejection in the face of all the evidence must show that it was based on the totality of the evidence. Facts established by rebuttal evidence must be evaluated along with the facts on which the conclusion of obviousness was

reached, not against the conclusion itself. *In re Eli Lilly & Co.*, 902 F.2d 943, 14 USPQ2d 1741 (Fed. Cir. 1990).

See *In re Piasecki*, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984) for a discussion of the proper roles of the examiner’s *prima facie* case and applicant’s rebuttal evidence in the final determination of obviousness. See MPEP § 706.02(j) for a discussion of the proper contents of a rejection under 35 U.S.C. 103.

## **2143 Basic Requirements of a *Prima Facie* Case of Obviousness**

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant’s disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

### **2143.01 Suggestion or Motivation To Modify the References [R-2]**

#### **THE PRIOR ART MUST SUGGEST THE DESIRABILITY OF THE CLAIMED INVENTION**

“There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.” *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper.). The level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

“In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification.” *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972).

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. “The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art.” *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

>*In Ruiz v. A.B. Chance Co.*, 357 F.3d 1270, 69 USPQ2d 1686 (Fed. Cir. 2004), the patent claimed underpinning a slumping building foundation using a screw anchor attached to the foundation by a metal bracket. One prior art reference taught a screw anchor with a concrete bracket, and a second prior art reference disclosed a pier anchor with a metal bracket. The court found motivation to combine the references to arrive at the claimed invention in the “nature of the problem to be solved” because each reference was directed “to precisely the same problem of underpinning slumping foundations.” *Id.* at 1276, 69 USPQ2d at 1690. The court also *rejected* the notion that “an express written motivation to combine must appear in prior art references....” *Id.* at 1276, 69 USPQ2d at 1690.<

In *In re Kotzab*, the claims were drawn to an injection molding method using a single temperature sensor to control a plurality of flow control valves. The primary reference disclosed a multizone device having multiple sensors, each of which controlled an

associated flow control valve, and also taught that one *system* may be used to control a number of valves. The court found that there was insufficient evidence to show that one *system* was the same as one *sensor*. While the control of multiple valves by a single sensor rather than by multiple sensors was a “technologically simple concept,” there was no finding “as to the specific understanding or principle within the knowledge of the skilled artisan” that would have provided the motivation to use a single sensor as the system to control more than one valve. 217 F.3d at 1371, 55 USPQ2d at 1318.

In *In re Fine*, the claims were directed to a system for detecting and measuring minute quantities on nitrogen compounds comprising a gas chromatograph, a converter which converts nitrogen compounds into nitric oxide by combustion, and a nitric oxide detector. The primary reference disclosed a system for monitoring sulfur compounds comprising a chromatograph, combustion means, and a detector, and the secondary reference taught nitric oxide detectors. The examiner and Board asserted that it would have been within the skill of the art to substitute one type of detector for another in the system of the primary reference, however the court found there was no support or explanation of this conclusion and reversed.

In *In re Jones*, the claimed invention was the 2-(2 $\phi$ -aminoethoxy) ethanol salt of dicamba, a compound with herbicidal activity. The primary reference disclosed *inter alia* the substituted ammonium salts of dicamba as herbicides, however the reference did not specifically teach the claimed salt. Secondary references teaching the amine portion of the salt were directed to shampoo additives and a byproduct of the production of morpholine. The court found there was no suggestion to combine these references to arrive at the claimed invention.

#### **WHERE THE TEACHINGS OF THE PRIOR ART CONFLICT, THE EXAMINER MUST WEIGH THE SUGGESTIVE POWER OF EACH REFERENCE**

The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art, and all teachings in the prior art must be considered to the extent that they are in analogous arts. Where the teachings of two or more

prior art references conflict, the examiner must weigh the power of each reference to suggest solutions to one of ordinary skill in the art, considering the degree to which one reference might accurately discredit another. *In re Young*, 927 F.2d 588, 18 USPQ2d 1089 (Fed. Cir. 1991) (Prior art patent to Carlisle disclosed controlling and minimizing bubble oscillation for chemical explosives used in marine seismic exploration by spacing seismic sources close enough to allow the bubbles to intersect before reaching their maximum radius so the secondary pressure pulse was reduced. An article published several years later by Knudsen opined that the Carlisle technique does not yield appreciable improvement in bubble oscillation suppression. However, the article did not test the Carlisle technique under comparable conditions because Knudsen did not use Carlisle's spacing or seismic source. Furthermore, where the Knudsen model most closely approximated the patent technique there was a 30% reduction of the secondary pressure pulse. On these facts, the court found that the Knudsen article would not have deterred one of ordinary skill in the art from using the Carlisle patent teachings.).

**FACT THAT REFERENCES CAN BE COMBINED OR MODIFIED IS NOT SUFFICIENT TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS**

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990) (Claims were directed to an apparatus for producing an aerated cementitious composition by drawing air into the cementitious composition by driving the output pump at a capacity greater than the feed rate. The prior art reference taught that the feed means can be run at a variable speed, however the court found that this does not require that the output pump be run at the claimed speed so that air is drawn into the mixing chamber and is entrained in the ingredients during operation. Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so." 916 F.2d at 682, 16 USPQ2d at 1432.). See also *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992) (flexible landscape edging device which is conformable to a ground surface of

varying slope not suggested by combination of prior art references).

**FACT THAT THE CLAIMED INVENTION IS WITHIN THE CAPABILITIES OF ONE OF ORDINARY SKILL IN THE ART IS NOT SUFFICIENT BY ITSELF TO ESTABLISH *PRIMA FACIE* OBVIOUSNESS**

A statement that modifications of the prior art to meet the claimed invention would have been "'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levensgood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references.).

**THE PROPOSED MODIFICATION CANNOT RENDER THE PRIOR ART UNSATISFACTORY FOR ITS INTENDED PURPOSE**

If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) (Claimed device was a blood filter assembly for use during medical procedures wherein both the inlet and outlet for the blood were located at the bottom end of the filter assembly, and wherein a gas vent was present at the top of the filter assembly. The prior art reference taught a liquid strainer for removing dirt and water from gasoline and other light oils wherein the inlet and outlet were at the top of the device, and wherein a pet-cock (stopcock) was located at the bottom of the device for periodically removing the

collected dirt and water. The reference further taught that the separation is assisted by gravity. The Board concluded the claims were *prima facie* obvious, reasoning that it would have been obvious to turn the reference device upside down. The court reversed, finding that if the prior art device was turned upside down it would be inoperable for its intended purpose because the gasoline to be filtered would be trapped at the top, the water and heavier oils sought to be separated would flow out of the outlet instead of the purified gasoline, and the screen would become clogged.).

“Although statements limiting the function or capability of a prior art device require fair consideration, simplicity of the prior art is rarely a characteristic that weighs against obviousness of a more complicated device with added function.” *In re Dance*, 160 F.3d 1339, 1344, 48 USPQ2d 1635, 1638 (Fed. Cir. 1998) (Court held that claimed catheter for removing obstruction in blood vessels would have been obvious in view of a first reference which taught all of the claimed elements except for a “means for recovering fluid and debris” in combination with a second reference describing a catheter including that means. The court agreed that the first reference, which stressed simplicity of structure and taught emulsification of the debris, did not teach away from the addition of a channel for the recovery of the debris.).

#### **THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE OF OPERATION OF A REFERENCE**

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) (Claims were directed to an oil seal comprising a bore engaging portion with outwardly biased resilient spring fingers inserted in a resilient sealing member. The primary reference relied upon in a rejection based on a combination of references disclosed an oil seal wherein the bore engaging portion was reinforced by a cylindrical sheet metal casing. Patentee taught the device required rigidity for operation, whereas the claimed invention required resiliency. The court reversed the rejection holding

the “suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.” 270 F.2d at 813, 123 USPQ at 352.).

#### **2143.02 Reasonable Expectation of Success Is Required**

##### **OBVIOUSNESS REQUIRES ONLY A REASONABLE EXPECTATION OF SUCCESS**

The prior art can be modified or combined to reject claims as *prima facie* obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986) (Claims directed to a method of treating depression with amitriptyline (or nontoxic salts thereof) were rejected as *prima facie* obvious over prior art disclosures that amitriptyline is a compound known to possess psychotropic properties and that imipramine is a structurally similar psychotropic compound known to possess antidepressive properties, in view of prior art suggesting the aforementioned compounds would be expected to have similar activity because the structural difference between the compounds involves a known bioisosteric replacement and because a research paper comparing the pharmacological properties of these two compounds suggested clinical testing of amitriptyline as an antidepressant. The court sustained the rejection, finding that the teachings of the prior art provide a sufficient basis for a reasonable expectation of success.); *Ex parte Blanc*, 13 USPQ2d 1383 (Bd. Pat. App. & Inter. 1989) (Claims were directed to a process of sterilizing a polyolefinic composition with high-energy radiation in the presence of a phenolic polyester antioxidant to inhibit discoloration or degradation of the polyolefin. Appellant argued that it is unpredictable whether a particular antioxidant will solve the problem of discoloration or degradation. However, the Board found that because the prior art taught that appellant’s preferred antioxidant is very efficient and provides better results compared with other prior art antioxidants, there would have been a reasonable expectation of success.).

In re Dembiczak (CA FC) 50 USPQ2d 1614

**In re Dembiczak**

**U.S. Court of Appeals Federal Circuit  
50 USPQ2d 1614**

**Decided April 28, 1999  
No. 98-1498**

**Headnotes**

**PATENTS**

**1. Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)**

Decision rejecting claims in utility application as obvious over combination of prior art references must be reversed, since obviousness analysis in decision is limited to discussion of ways that multiple references can be combined to read on claimed invention, but does not particularly identify any suggestion, teaching, or motivation to combine references, and does not include specific or inferential findings concerning identification of relevant art, level of ordinary

skill in art, nature of problem to be solved, or any other factual findings that might support proper obviousness analysis.

## **2. Patentability/Validity -- Anticipation -- Double patenting (§ 115.0708)**

Obviousness-type double patenting may be found between design and utility patents in rare cases, but such rejection is appropriate only if claims of two patents cross-read, meaning that subject matter of claims of patent sought to be invalidated would have been obvious from subject matter of claims of other patent, and vice-versa.

## **3. Patentability/Validity -- Anticipation -- Double patenting (§ 115.0708)**

Applicants' design patents for bag with jack-o'-lantern face would not have been obvious variants of their pending utility claims directed to trash bag decorated to resemble Halloween pumpkin when filled with trash or leaves, since textual description of "facial indicia" on bag found in claims of utility patent application cannot constitute design reference that is "basically the same as" specific designs claimed in applicants' patentably distinct design patents.

## **Case History and Disposition:**

Page 1614

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Application of Anita Dembiczak and Benson Zinbarg for utility patent (application serial no.



08/427,732). From decision sustaining rejections of claims in application, applicants appeal. Reversed.

**Attorneys:**

David P. Gordon and Thomas A. Gallagher, Stamford, Conn., for appellants.

John M. Whealan, associate solicitor, Albin F. Drost, acting solicitor, and David R. Nicholson, associate solicitor, Office of the Solicitor, Arlington, Va., for appellee.

**Judge:**

Before Mayer, chief judge, and Michel and Clevenger, circuit judges.

**Opinion Text**

**Opinion By:**

Clevenger, J.

Anita Dembiczak and Benson Zinbarg appeal the rejection, upheld by the Board of Patent Appeals and Interferences, of all pending claims in their Application No. 08/427,732. *See Ex Parte Dembiczak*, No. 96-2648, slip op. at 43 (May 14, 1998). Because the Board erred in sustaining rejections of the pending claims as obvious under 35 U.S.C. Section 103(a) (Supp. 1998), and for obviousness-type double patenting, we reverse.

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I

The invention at issue in this case is, generally speaking, a large trash bag made of orange plastic

and decorated with lines and facial features, allowing the bag, when filled with trash or leaves, to resemble a Halloween-style pumpkin, or jack-o'-lantern. As the inventors, Anita Dembiczak and Benson Zinbarg (collectively, "Dembiczak") note, the invention solves the long-standing problem of unsightly trash bags placed on the curbs of America, and, by fortuitous happenstance, allows users to express their whimsical or festive nature while properly storing garbage, leaves, or other household debris awaiting collection. Embodiments of the invention--sold under a variety of names, including Giant Stuff-A-Pumpkin(trade mark), Funkins, Jack Sak(trade mark), and Bag-O-Fun(trade mark)--have undisputedly been well-received by consumers, who bought more than seven million units in 1990 alone. Indeed, in 1990, the popularity of the pumpkin bags engendered a rash of thefts around Houston, Texas, leading some owners to resort to preventative measures, such as greasing the bags with petroleum jelly and tying them to trees. See R. Piller, "Halloween Hopes Die on the Vine," *Hous. Chron.*, Oct. 19, 1990, at 13A.

The road to profits has proved much easier than the path to patentability, however. In July 1989, Dembiczak filed a utility patent application generally directed to the pumpkin bags. In a February 1992 appeal, the Board of Patent Appeals and Interferences ("the Board") reversed the Examiner's rejection, but entered new grounds for rejection. Dembiczak elected to continue prosecution, filing a continuation application to address the new grounds for rejection. Thereafter, the invention made a second appearance before the Board, in April 1993, when the Board both sustained the Examiner's rejection and again entered new grounds for rejection. Again, a continuation application was filed (the instant application). And again the Examiner's rejection was appealed to the Board, which sustained the rejection in a May 14, 1998, decision. See *Dembiczak*, slip op. at 43.

## A

The patent application at issue includes claims directed to various embodiments of the pumpkin bag. Claims 37, 49, 51, 52, 58 through 64, 66 through 69, and 72 through 81 are at issue in this appeal. Though the claims vary, independent claim 74 is perhaps most representative:  
74. A decorative bag for use by a user with trash filling material, the bag simulating the general outer appearance of an outer surface of a pumpkin having facial indicia thereon, comprising:  
a flexible waterproof plastic trash or leaf bag having  
an outer surface which is premanufactured orange in color for the user to simulate the general

appearance of the outer skin of a pumpkin, and having facial indicia including at least two of an eye, a nose and a mouth on the orange color outer surface for forming a face pattern on said orange color outer surface to simulate the general outer appearance of a decorative pumpkin with a face thereon, said trash or leaf bag having first and second opposite ends, at least said second end having an opening extending substantially across the full width of said trash or leaf bag for receiving the trash filling material, wherein when said trash or leaf bag is filled with trash filling material and closed, said trash or leaf bag takes the form and general appearance of a pumpkin with a face thereon. All of the independent claims on appeal, namely 37, 52, 72, and 74, contain limitations that the bag must be "premanufactured orange in color," have "facial indicia," have openings suitable for filling with trash material, and that when filled, the bag must have a generally rounded appearance, like a pumpkin. Independent claims 37, 52, and 72 add the limitation that the bag's height must at least 36 inches. Claim 72 requires that the bag be made of a "weatherproof material," and claim 74, as shown above, requires that the bag be "waterproof." Claim 52 recites a "method of assembling" a bag with the general characteristics of apparatus claim 37.

**B**

The prior art cited by the Board includes:

- (1) pages 24-25 of a book entitled "A Handbook for Teachers of Elementary Art," by Holiday Art Activities ("Holiday"), describing how to teach children to make a "Crepe Paper Jack-O-Lantern" out of a strip of orange crepe paper, construction paper cut-outs in the shape of facial features, and "wadded newspapers" as filling;
- (2) page 73 of a book entitled "The Everything Book for Teachers of Young Children,"

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- by Martha Shapiro and Valerie Indenbaum ("Shapiro"), describing a method of making a "paper bag pumpkin" by stuffing a bag with newspapers, painting it orange, and then painting on facial features with black paint;
- (3) U.S. Patent No. 3,349,991 to Leonard Kessler, entitled "Flexible Container" ("Kessler"), describing a bag apparatus wherein the bag closure is accomplished by the use of folds or

gussets in the bag material;

(4) U.S. Patent No. Des. 310,023, issued August 21, 1990 to Dembiczak ("Dembiczak '023"), a design patent depicting a bag with a jack-o'-lantern face;

(5) U.S. Patent No. Des. 317,254, issued June 4, 1991 to Dembiczak ("Dembiczak '254"), a design patent depicting a bag with a jack-o'-lantern face; and,

(6) Prior art "conventional" plastic lawn or trash bags ("the conventional trash bags").

Using this art, the Board affirmed the Examiner's final rejection of all the independent claims (37, 52, 72, 74) under 35 U.S.C. Section 103, holding that they would have been obvious in light of the conventional trash bags in view of the Holiday and Shapiro references. The Board determined that, in its view of the prior art, "the only difference between the invention presently defined in the independent claims on appeal and the orange plastic trash bags of the prior art and the use of such bags resides in the application of the facial indicia to the outer surface of the bag." *Dembiczak*, slip op. at 18. The Board further held that the missing facial indicia elements were provided by the Holiday and Shapiro references' description of painting jack-o'-lantern faces on paper bags. *See id.* at 18-19. Dependent claims 49 and 79, which include a "gussets" limitation, were considered obvious under similar reasoning, except that the references cited against them included Kessler. *See id.* at 7.

The Board also affirmed the Examiner's obviousness-type double patenting rejection of all the independent claims in light of the two Dembiczak design patents ('023 and '254) and Holiday. *See id.* at 12. The Board held that the design patents depict a generally rounded bag with jack-o'-lantern facial indicia, and that the Holiday reference supplies the missing limitations, such as the "thin, flexible material" of manufacture, the orange color, the initially-open upper end, and the trash filling material. The Board also stated that the various limitations of the dependent claims-- *e.g.*, color, the inclusion of leaves as stuffing, and the dimensions--would all be obvious variations of the depictions in the Dembiczak design patents. *See id.* at 8-9. In addition, using a two-way test for obviousness-type double patenting, the Board held that the claims of the Dembiczak design patents "do not exclude" the additional structural limitations of the pending utility claims, and thus the design patents were merely obvious variations of the subject matter disclosed in the utility claims. *See id.* at 11. The Board further upheld, on similar grounds and with the inclusion of the Kessler reference, the obviousness-type double patenting rejection of dependent claim 49. *See id.* at 12.

This appeal followed, vesting this court with jurisdiction pursuant to 28 U.S.C. Section

1295(a)(4)(A) (1994).

## II

A claimed invention is unpatentable if the differences between it and the prior art "are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art." 35 U.S.C. Section 103(a) (Supp. 1998); *see Graham v. John Deere Co.*, 383 U.S. 1, 14, 148 USPQ 459, 465 (1966). The ultimate determination of whether an invention is or is not obvious is a legal conclusion based on underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness. *See Graham*, 383 U.S. at 17-18, 148 USPQ at 467; *Miles Labs, Inc., Inc. v. Shandon Inc.*, 997 F.2d 870, 877, 27 USPQ2d 1123, 1128 (Fed. Cir. 1993). We therefore review the ultimate determination of obviousness without deference to the Board, while examining any factual findings for clear error. *See, e.g., In re Zurko*, 142 F.3d 1447, 1459, 46 USPQ2d 1691, 1700 (Fed. Cir.) (en banc), *cert. granted*, 119 S. Ct. 401 (1998).

## A

Our analysis begins in the text of section 103 quoted above, with the phrase "at the time the invention was made." For it is this phrase that guards against entry into the "tempting but forbidden zone of hindsight," *see Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 873, 228 USPQ 90, 98 (Fed. Cir. 1985), *overruled on other grounds by Nobelpharma AB v. Implant Innovations, Inc.*, 141 F.3d 1059, 46 USPQ2d 1097 (Fed. Cir. 1998),

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when analyzing the patentability of claims pursuant to that section. Measuring a claimed invention against the standard established by section 103 requires the oft-difficult but critical step of casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. *See, e.g., W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983). Close adherence to this methodology is especially important in the

case of less technologically complex inventions, where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *Id.*

Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references. *See, e.g., C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998) (describing "teaching or suggestion or motivation [to combine]" as an "essential evidentiary component of an obviousness holding"); *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998) ("the Board must identify specifically . . . the reasons one of ordinary skill in the art would have been motivated to select the references and combine them"); *In re Fritch*, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (examiner can satisfy burden of obviousness in light of combination "only by showing some objective teaching [leading to the combination]"); *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988) (evidence of teaching or suggestion "essential" to avoid hindsight); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297, 227 USPQ 657, 667 (Fed. Cir. 1985) (district court's conclusion of obviousness was error when it "did not elucidate any factual teachings, suggestions or incentives from this prior art that showed the propriety of combination"). *See also Graham*, 383 U.S. at 18, 148 USPQ at 467 ("strict observance" of factual predicates to obviousness conclusion required). Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight. *See, e.g., Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985) ("The invention must be viewed not with the blueprint drawn by the inventor, but in the state of the art that existed at the time."). In this case, the Board fell into the hindsight trap. We have noted that evidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, *see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), *Para-Ordinance Mfg. v. SGS Imports Intern., Inc.*, 73 F.3d 1085, 1088, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995), although "the suggestion more often comes from the teachings of the pertinent references," *Rouffet*, 149 F.3d at 1355, 47 USPQ2d at 1456. The range of sources available,

however, does not diminish the requirement for actual evidence. That is, the showing must be clear and particular. *See, e.g., C.R. Bard*, 157 F.3d at 1352, 48 USPQ2d at 1232. Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence." *E.g., McElmurry v. Arkansas Power & Light Co.*, 995 F.2d 1576, 1578, 27 USPQ2d 1129, 1131 (Fed. Cir. 1993) ("Mere denials and conclusory statements, however, are not sufficient to establish a genuine issue of material fact."); *In re Sichert*, 566 F.2d 1154, 1164, 196 USPQ 209, 217 (CCPA 1977) ("The examiner's conclusory statement that the specification does not teach the best mode of using the invention is unaccompanied by evidence or reasoning and is entirely inadequate to support the rejection."). In addition to demonstrating the propriety of an obviousness analysis, particular factual findings regarding the suggestion, teaching, or motivation to combine serve a number of important purposes, including: (1) clear explication of the position adopted by the Examiner and the Board; (2) identification of the factual disputes, if any, between the applicant and the Board; and (3) facilitation of review on appeal. Here, however, the Board did not make particular findings regarding the locus of the suggestion, teaching, or motivation to combine the prior art references.

[1] All the obviousness rejections affirmed by the Board resulted from a combination of prior art references, *e.g.*, the conventional trash or yard bags, and the Holiday and Shapiro publications teaching the construction of decorated paper bags. *See Dembiczak*, slip op. at 6-7. To justify this combination, the Board simply stated that "the Holiday and Shapiro references would have

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suggested the application of . . . facial indicia to the prior art plastic trash bags." *Id.* at 18-19. However, rather than pointing to specific information in Holiday or Shapiro that suggest the combination with the conventional bags, the Board instead described in detail the similarities between the Holiday and Shapiro references and the claimed invention, noting that one reference or the other--in combination with each other and the conventional trash bags--described all of the limitations of the pending claims. *See id.* at 18-28. Nowhere does the Board particularly identify any suggestion, teaching, or motivation to combine the children's art references (Holiday and Shapiro) with the conventional trash or lawn bag references, nor does the Board make specific--or even inferential--findings concerning the identification of the relevant art, the level

of ordinary skill in the art, the nature of the problem to be solved, or any other factual findings that might serve to support a proper obviousness analysis. See, e.g., *Pro-Mold & Tool*, 75 F.3d at 1573, 37 USPQ2d at 1630.

To the contrary, the obviousness analysis in the Board's decision is limited to a discussion of the ways that the multiple prior art references can be combined to read on the claimed invention. For example, the Board finds that the Holiday bag reference depicts a "premanufactured orange" bag material, see *Dembiczak*, slip op. at 21, finds that Shapiro teaches the use of paper bags in various sizes, including "large", see *id.* at 22-23, and concludes that the substitution of orange plastic for the crepe paper of Holiday and the paper bags of Shapiro would be an obvious design choice, see *id.* at 24. Yet this reference-by-reference, limitation-by-limitation analysis fails to demonstrate how the Holiday and Shapiro references teach or suggest their combination with the conventional trash or lawn bags to yield the claimed invention. See *Rouffet*, 149 F.3d at 1357, 47 USPQ2d at 1459 (noting Board's failure to explain, when analyzing the prior art, "what specific understanding or technical principle . . . would have suggested the combination"). Because we do not discern any finding by the Board that there was a suggestion, teaching, or motivation to combine the prior art references cited against the pending claims, the Board's conclusion of obviousness, as a matter of law, cannot stand. See *C.R. Bard*, 157 F.3d at 1352, 48 USPQ2d at 1232; *Rouffet*, 149 F.3d at 1359, 47 USPQ2d at 1459; *Fritch*, 972 F.2d at 1265, 23 USPQ2d at 1783; *Fine*, 837 F.2d at 1075, 5 USPQ2d at 1600; *Ashland Oil*, 776 F.2d at 297, 227 USPQ at 667.

## B

The Commissioner of Patents and Trademarks ("Commissioner") attempts to justify the Board's decision on grounds different from that relied upon by the Board, arguing that one of ordinary skill in the art would have been motivated to combine the references. Of course, in order to do so, the Commissioner must do what the Board did not do below: make specific findings of fact regarding the level of skill in the art ("a designer and manufacturer of trash and leaf bags, particularly one specializing in the ornamental and graphic design of such bags"), *Resp't Br.* at 14, the relationship between the fields of conventional trash bags and children's crafts, respectively ("[t]he artisan would also have been well aware of the ancillary, corollary, and atypical uses of 'trash' bags such as their application in hobby and art projects"), *Resp't Br.* at 15, and the particular features of the prior art references that would motivate one of ordinary



skill in a particular art to select elements disclosed in references from a wholly different field ("a designer and manufacturer of trash and leaf bags would have recognized the paper bag in Shapiro to be a trash bag and therefore would have been motivated to combine it with the admitted prior art plastic trash and leaf bags to arrive at the claimed invention"), *Resp't Br.* at 15. The Commissioner also appears to cite additional references in support of his obviousness analysis, noting that at least two design patents (in the record but not cited against the presently pending claims) teach the placement of "graphical information, including text, designs, and even facial indicia, to colored bags." *Resp't Br.* at 16. This new analysis, apparently cut from whole cloth in view of appeal, does little more than highlight the shortcomings of the decision below, and we decline to consider it. *See, e.g., In re Robertson*, 169 F.3d 743, 49 USPQ2d 1949, 1951 (Fed. Cir. 1999) ("We decline to consider [the Commissioner's] newly-minted theory as an alternative ground for upholding the agency's decision."); *In re Soni*, 54 F.3d 746, 751, 34 USPQ2d 1684, 1688 (Fed. Cir. 1995); *In re Hounsfield*, 699 F.2d 1320, 1324, 216 USPQ 1045, 1049 (Fed. Cir. 1983) (rejecting an "attempt [ ] by the Commissioner 'to apply a new rationale to support the rejection.'"); *see also* 35 U.S.C. Section 144 (1994) (an appeal to the Federal Circuit "is taken on the record before The Patent and Trademark Office"). Because the Board has not established a *prima facie* case of obviousness, *see In re Bell*, 991 F.2d 781,

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783, 26 USPQ2d 1529, 1531 (Fed. Cir. 1993) ("The PTO bears the burden of establishing a case of *prima facie* obviousness."), we therefore reverse the obviousness rejections, and have no need to address the parties' arguments with respect to secondary factors.

### III

Dembiczak also asks this court to reverse the Board's rejection of the pending claims for obviousness-type double patenting, which is a judicially-created doctrine that seeks to prevent the applicant from expanding the grant of the patent right beyond the limits prescribed in Title 35. *See, e.g., In re Braat*, 937 F.2d 589, 592, 19 USPQ2d 1289, 1291-92 (Fed. Cir. 1991); *In re Longi*, 759 F.2d 887, 892, 225 USPQ 645, 648 (Fed. Cir. 1985). *See also* 35 U.S.C. Section 154(a)(2) (Supp. 1998) (discussing patent term). The doctrine prohibits claims in

a second patent which define "merely an obvious variation" of an invention claimed by the same inventor in an earlier patent. *Braat* , 937 F.2d at 592, 19 USPQ2d at 1292 (quoting *In re Vogel* , 422 F.2d 438, 441, 164 USPQ 619, 622 (CCPA 1970)). Thus, unless a claim sought in the later patent is patentably distinct from the claims in an earlier patent, the claim must be rejected. See *In re Goodman* , 11 F.3d 1046, 1052, 29 USPQ2d 2010, 2015 (Fed. Cir. 1993); *Vogel* , 422 F.2d at 441, 164 USPQ at 622. This question is one of law, which we review *de novo* . See *Goodman* , 11 F.3d at 1052, 29 USPQ2d at 2015; *Texas Instruments Inc. v. United States Int'l Trade Comm'n* , 988 F.2d 1165, 1179, 26 USPQ2d 1018, 1029 (Fed. Cir. 1993).

## A

[2] The law provides that, in some very rare cases, obvious-type double patenting may be found between design and utility patents. See *Carman Indus., Inc. v. Wahl* , 724 F.2d 932, 939-40, 220 USPQ 481, 487 (Fed. Cir. 1983) (noting that, while theoretically possible, "[d]ouble patenting is rare in the context of utility versus design patents"); *In re Thorington* , 418 F.2d 528, 536-37, 163 USPQ 644, 650 (CCPA 1969) (Double patenting between a design and utility patent is possible "if the features producing the novel aesthetic effect of a design patent or application are the same as those recited in the claims of a utility patent or application as producing a novel structure."); *In re Phelan* , 205 F.2d 183, 98 USPQ 156 (CCPA 1953); *In re Barber* , 81 F.2d 231, 28 USPQ 187 (CCPA 1936); *In re Hargraves* , 53 F.2d 900, 11 USPQ 240 (CCPA 1931). In these cases, a "two-way" test is applicable. See *Carman* , 724 F.2d at 940, 220 USPQ at 487. Under this test, the obviousness-type double patenting rejection is appropriate only if the claims of the two patents cross-read, meaning that "the test is whether the subject matter of the claims of the patent sought to be invalidated would have been obvious from the subject matter of the claims of the other patent, and vice versa." *Id.* , 220 USPQ at 487. See also *Braat* , 937 F.2d at 593, 19 USPQ2d at 1292 (explaining two-way test).

## B

In making its double patenting rejection, the Board concluded that all but one of the pending claims of Dembiczak's utility application would have been merely an obvious variation of the claims of the earlier-issued design patents--the Dembiczak '023 and '254 references--in light of the Holiday reference. The remaining claim, dependent claim 49, was judged obvious in light of

the combination of the Dembiczak design patents, Holiday, and the Kessler reference.

[3] Acknowledging that the two-way test was required by *Carman*, 724 F.2d at 940, 220 USPQ at 487, the Board concluded that "the design claimed in each of appellants' design patents does not exclude the features pertaining to the construction and color of the bag, the use of a plastic material for making the bag, the size or thickness of the bag . . . or the use of various types of filling material . . . . The particular details of the facial indicia would have been a matter of design choice as evidenced by the Holiday handbook," and that therefore, in view of Holiday, the claims of the design patents were obvious variants of the pending utility patent claims. See *Dembiczak*, slip op. at 11. We disagree. In order for a design to be unpatentable because of obviousness, there must first be a basic design reference in the prior art, the design characteristics of which are "basically the same as the claimed design." *In re Borden*, 90 F.3d 1570, 1574, 39 USPQ2d 1524, 1526 (Fed. Cir. 1996); *In re Rosen*, 673 F.2d 388, 391, 213 USPQ 347, 350 (CCPA 1982). The phrase "having facial indicia thereon" found in the claims of the pending utility application is not a design reference that is "basically the same as the claimed design." *Borden*, 90 F.3d at 1574, 39 USPQ2d at 1526. In fact, it describes precious little with respect to design characteristics.

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The Board's suggestion that the design details were simply "a matter of design choice" evinces a misapprehension of the subject matter of design patents. *E.g.*, *Carman*, 724 F.2d at 939 n.13, 220 USPQ at 486 n.13 ("Utility patents afford protection for the mechanical structure and function of an invention whereas design patent protection concerns the ornamental or aesthetic features of a design.") Indeed, we note that the two design patents at issue here--the Dembiczak '023 and '254 patents--were considered nonobvious over each other, and were even the subject of a restriction requirement. See 35 U.S.C. Section 121 (1994) ("If two or more independent and distinct inventions are claimed in one application, the Commissioner may require the application to be restricted to one of the inventions."); 37 C.F.R. Section 1.142. The position adopted by the Board--that a textual description of facial indicia found in the claims of the utility patent application makes obvious the specific designs claimed in the (patentably distinct) Dembiczak design patents--would presumably render obvious, or even anticipate, all design patents where a face was depicted on a bag. But this, of course, is not the law; the textual

description cannot be said to be a reference "basically the same as the claimed design," of the design patents at issue here. *Borden* , 90 F.3d at 1574, 39 USPQ2d at 1526 (internal quotation marks omitted). The Board's conclusion of obviousness is incorrect.

Because we find that the Board erred in concluding that the design patents were obvious variants of the pending utility claims, we need not address the other prong of the two-way double patenting test--whether the pending utility claims are obvious variations of the subject matter claimed in the design patents. See *Carman* , 724 F.2d at 939, 220 USPQ at 487 (both prongs of the two-way test required for obviousness-type double patenting). The double patenting rejections are reversed.

#### IV

Because there is no evidence in the record of a suggestion, teaching, or motivation to combine the prior art references asserted against the pending claims, the obviousness rejections are reversed. In addition, because the Board misapprehended the test for obviousness-type double patenting, and because the pending utility claims do not render obvious the design patents, the double patenting rejections are also reversed.

**REVERSED .**

**- End of Case -**

In re Rouffet (CA FC) 47 USPQ2d 1453

**In re Rouffet**

**U.S. Court of Appeals Federal Circuit  
47 USPQ2d 1453**

**Decided July 15, 1998  
No. 97-1492**

**Headnotes**

**PATENTS**

**1. Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)**

Claimed low orbit satellite communications system for mobile terminals, which addresses problem of minimizing "handover" of receiver from beam footprint of one transmitting satellite to that of another through use of multiple fan-shaped beams, is not prima facie obvious over combination of three prior art references, since critical reference that teaches use of fan-shaped beam to transmit from ground station to orbiting satellites does not specifically address handover

minimization, and to extent it addresses handover problem at all, does so with orbit selection rather than beam shape, and since there is no reason one of ordinary skill in art, seeking to minimize handovers due to satellite motion, would have been motivated to combine this reference with remaining references in manner that would render claimed invention obvious.

**2. Patentability/Validity -- Obviousness -- Person of ordinary skill in art (§ 115.0902)**

**Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)**

Three possible sources for motivation to combine prior art references in manner that would render claimed invention obvious are nature of problem to be solved, teachings of prior art, and knowledge of persons of ordinary skill in art; high level of skill in field of art cannot be relied upon to provide necessary motivation absent explanation of what specific understanding or technical principle, within knowledge one of ordinary skill in art, would have suggested combination, since, if such rote invocation could suffice to supply motivation to combine, more sophisticated scientific fields would rarely, if ever, experience patentable technical advance.

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**3. Patentability/Validity -- Obviousness -- Person of ordinary skill in art (§ 115.0902)**

**Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)**

Claimed low orbit satellite communications system for mobile terminals is not prima facie obvious over combination of two prior art references, even though person possessing high level of skill characteristic of this field would know to account for differences between claimed

invention and prior art combination, since high level of skill in art, without more, cannot supply required motivation to combine references, and does not overcome absence of any actual suggestion to combine; obviousness rejection will not be upheld, even where skill in art is high, absent specific identification of principle, known to one of ordinary skill, that suggests claimed combination.

## Case History and Disposition:

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Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Denis Rouffet, Yannick Tanguy, and Frederic Berthault, serial no. 07/888,791, filed May 27, 1992. From decision upholding examiner's final rejection of application as obvious under 35 USC 103(a), applicants appeal. Reversed.

## Attorneys:

Richard C. Turner and Grant K. Rowan, of Sughrue, Mion, Zinn, Macpeak & Seas, Washington, D.C., for appellants.

David J. Ball Jr., associate solicitor, Nancy J. Linck, solicitor, Albin F. Drost, deputy solicitor, Craig R. Kaufman, associate solicitor, and Scott A. Chambers, associate solicitor, U.S. Patent and Trademark Office, Arlington, Va., for appellee.

**Judge:**

Before Plager, circuit, judge, Archer, senior circuit judge, and Rader, circuit judge.

**Opinion Text**

**Opinion By:**

Rader, J.

Denis Rouffet, Yannick Tanguy, and Frederic Berthault (collectively, Rouffet) submitted application 07/888,791 (the application) on May 27, 1992. The Board of Patent Appeals and Interferences (the Board) affirmed final rejection of the application as obvious under 35 U.S.C. Section 103(a). *See Ex parte Rouffet*, No. 96-1553 (Bd. Pat. App. & Int. Apr. 16, 1997). Because the Board reversibly erred in identifying a motivation to combine the references, this court reverses.

**I.**

Satellites in a geosynchronous or geostationary orbit remain over the same point on the Earth's surface. Their constant position above the Earth's surface facilitates communications. These satellites project a number of beams to the Earth. Each beam transmits to its area of coverage, or footprint, on the Earth's surface. In order to provide complete coverage, adjacent footprints overlap slightly and therefore must use different frequencies to avoid interference. However, two or more non-overlapping footprints can use the same set of frequencies in order to use efficiently the limited radio spectrum. Figure 1 from the application shows the coverage of a portion of the Earth's surface provided by multiple cone shaped beams:



Frequency reuse techniques, however, have a limited ability to compensate for congestion in geostationary orbits. To alleviate the orbit congestion problem, new telecommunications systems use a network of satellites in low Earth orbit. When viewed from a fixed point on the Earth's surface, such satellites do not remain stationary but move overhead. A satellite's motion as it



transmits a plurality of cone-shaped beams creates a new problem. The satellite's movement causes a receiver on the Earth's surface to move from the footprint of one beam into a second beam transmitted by the same satellite. Eventually, the satellite's motion causes the receiver to move from the footprint of a beam transmitted by one satellite into the footprint of a beam transmitted by a second satellite. Each switch from one footprint to another creates a "handover" event analogous to that which occurs when a traditional cellular phone travels from one cell to another. Handovers are undesirable because

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they can cause interruptions in signal transmission and reception. Rouffet's application discloses technology to reduce the number of handovers between beams transmitted by the same satellite. In particular, Rouffet eliminates handovers caused solely by the satellite's motion. To accomplish this goal, Rouffet changes the shape of the beam transmitted by the satellite's antenna. Rouffet's satellites transmit fan-shaped beams. A fan beam has an elliptical footprint. Rouffet aligns the long axis of his beams parallel to the direction of the satellite's motion across the Earth's surface. By elongating the beam's footprint in the direction of satellite travel, Rouffet's invention ensures that a fixed point on the Earth's surface likely will remain within a single footprint until it is necessary to switch to another satellite. Because Rouffet's invention does not address handovers caused by the motion of the receiver across the Earth's surface, his arrangement reduces, but does not eliminate, handovers. Figure 3 from the application shows the footprints 12 from six beams aligned in the direction of satellite motion 15:



The application contains ten claims that stand or fall as a group. Claim 1 is representative: A low orbit satellite communications system for mobile terminals, wherein the communications antenna system of each satellite provides isoflux coverage made up of a plurality of fan beams that are elongate in the travel direction of the satellite.

The examiner initially rejected Rouffet's claims as unpatentable over U.S. Pat. No. 5,199,672 (King) in view of U.S. Pat. No. 4,872,015 (Rosen) and a conference report entitled "A Novel Non-Geostationary Satellite Communications System," *Conference Record*, International

Conference on Communications, 1981 (Ruddy). On appeal to the Board, the examiner added an alternative ground for rejection, holding that the claims were obvious over U.S. Pat. No. 5,394,561 (Freeburg) in view of U.S. Pat. No. 5,170,485 (Levine).

On April 16, 1997, the Board issued its decision. Because Rouffet had specified that the claims would stand or fall as a group based on the patentability of claim 1, the Board limited its opinion to that claim. The Board unanimously determined that the examiner had properly rejected claim 1 as obvious over King in view of Rosen and Ruddy. The Board, on a split vote, also affirmed the rejection over Freeburg in view of Levine.

## II

To reject claims in an application under section 103, an examiner must show an un rebutted *prima facie* case of obviousness. See *In re Deuel*, 51 F.3d 1552, 1557, 34 USPQ2d 1210, 1214 (Fed. Cir. 1995). In the absence of a proper *prima facie* case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. See *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness. See *id.*

While this court reviews the Board's determination in light of the entire record, an applicant may specifically challenge an obviousness rejection by showing that the Board reached an incorrect conclusion of obviousness or that the Board based its obviousness determination on incorrect factual predicates. This court reviews the ultimate determination of obviousness as a question of law. See *In re Lueders*, 111 F.3d 1569, 1571, 42 USPQ2d 1481, 1482 (Fed. Cir. 1997). The factual predicates underlying an obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art. See *Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH*, 139 F.3d 877, 881, 45 USPQ2d 1977, 1981 (Fed. Cir. 1998). This court reviews the Board's factual findings for clear error. See *In re Zurko*, 142 F.3d 1447, 1449, 46 USPQ2d 1691, 1693 (Fed. Cir. 1998) (in banc); *Leuders*, 111 F.3d at 1571-72. "A finding is clearly erroneous when, although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed." *In re Graves*, 69 F.3d 1147, 1151, 36 USPQ2d

1697, 1700 (Fed. Cir. 1995) (quoting *United States v. United States Gypsum Co.* , 333 U.S. 364, 395 [ 76 USPQ 430 ] (1948)).

The secondary considerations are also essential components of the obviousness determination. See *In re Emert* , 124 F.3d 1458, 1462, 44 USPQ2d 1149, 1153 (Fed. Cir. 1997) ("Without Emert providing rebuttal evidence, this *prima facie* case of obviousness must stand."). This objective evidence of nonobviousness includes copying, long felt but unsolved need, failure of others, see *Graham v. John Deere Co.* , 383 U.S. 1, 17-18 [ 148 USPQ 459 ] (1966), commercial success, see *In re Huang* , 100 F.3d 135, 139-40, 40 USPQ2d 1685, 1689-90 (Fed. Cir. 1996), unexpected results created by the claimed invention, unexpected properties of the claimed invention, see *In re Mayne* , 104 F.3d 1339, 1342, 41 USPQ2d 1451, 1454 (Fed. Cir. 1997); *In re Woodruff* , 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990), licenses showing industry respect for the invention, see *Arkie Lures, Inc. v. Gene Larew Tackle, Inc.* , 119 F.3d 953, 957, 43 USPQ2d 1294, 1297 (Fed. Cir. 1997); *Pentec, Inc. v. Graphic Controls Corp.* , 776 F.2d 309, 316, 227 USPQ 766, 771 (Fed. Cir. 1985), and skepticism of skilled artisans before the invention, see *In re Dow Chem. Co.* , 837 F.2d 469, 473, 5 USPQ2d 1529, 1532 (Fed. Cir. 1988). The Board must consider all of the applicant's evidence. See *Oetiker* , 977 F.2d at 1445 ("An observation by the Board that the examiner made a *prima facie* case is not improper, as long as the ultimate determination of patentability is made on the entire record."); *In re Piasecki* , 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The court reviews factual conclusions drawn from this evidence for clear error. Whether the evidence presented suffices to rebut the *prima facie* case is part of the ultimate conclusion of obviousness and is therefore a question of law.

When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See *In re Geiger* , 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987). Although the suggestion to combine references may flow from the nature of the problem, see *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.* , 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1630 (Fed. Cir. 1996), the suggestion more often comes from the teachings of the pertinent references, see *In re Sernaker* , 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed. Cir. 1983), or from the ordinary knowledge of those skilled in the art

that certain references are of special importance in a particular field, *see Pro-Mold*, 75 F.3d at 1573 (citing *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 297 n.24, 227 USPQ 657, 667 n.24 (Fed. Cir. 1985)). Therefore, "[w]hen determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" *See In re Beattie*, 974 F.2d 1309, 1311-12, 24 USPQ2d 1040, 1042 (Fed. Cir. 1992) (quoting *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984)).

## II

The parties agree that the five references asserted by the examiner are in the same field of endeavor as the invention. The parties also agree that the pertinent level of skill in the art -- design of satellite communications systems -- is high. On appeal, Rouffet asserts that the examiner and the Board erred by improperly combining references to render the claimed invention obvious.

### ***The Combination of King, Rosen, and Ruddy***

The Board first affirmed the rejection of Rouffet's claims over a combination of King, Rosen, and Ruddy. King discloses a system for launching a plurality of satellites into low Earth orbits from a single launch vehicle. Rosen teaches a geostationary satellite that uses a plurality of fan beams with their long axes oriented in an east-west direction to communicate with mobile and fixed terminals on the Earth.

The final, and most important, reference in this combination is Ruddy. Ruddy describes a television broadcast system that uses a series of satellites to retransmit signals sent from a ground station over a wide area. Rather than using a geostationary orbit, Ruddy teaches the use of a series of satellites in Molniya orbits. A satellite in a Molniya orbit always follows the same path through the sky when viewed from a fixed point on the ground. Viewed from the Earth, the orbital path includes a narrow, elliptical apogee loop. In order to transmit to these moving satellites from a ground station, Ruddy uses a fan beam with a long axis aligned with the long axis of the orbit's apogee loop. This alignment places the entire apogee loop within the footprint of the beam and eliminates the need for the ground station's antenna to track the satellite's motion around the apogee loop. Ruddy further teaches orbit parameters

and spacing of multiple satellites to ensure that a satellite is always in the loop to receive and rebroadcast signals from the Earth station.

King and Rosen together teach the use of a network of satellites in low Earth orbit. Thus, Ruddy becomes the piece of the prior art mosaic that shows, in the reading of the Board, the use of "a plurality of fan beams that are elongate in the travel direction of the satellite." Ruddy, however, is different from the claimed invention in several respects. Specifically, the application claims the projection of multiple elliptical fan-shaped footprints from the satellite to the ground. See Claim 1, *supra*, see also Application at 6, lines 9-11 ("In addition, in this system, the geometrical shape of the beams 12 is changed: instead of being circular they are now elongate ellipses."). The application's written description further teaches that the invention's fan-shaped satellite beams will minimize handovers. See *id.* at lines 11-16 ("This considerably increases call durations between handovers.").

In contrast, Ruddy teaches that a ground station may use a single fan-shaped beam to transmit to a satellite in a unique Molniya orbit. The ground station transmits a beam into which a series of satellites in Molniya orbits will successively enter. At least two differences are evident: the application teaches projection of multiple beams from a satellite to the Earth, while Ruddy teaches projection of a single beam from the Earth to satellites. Moreover to the extent Ruddy contains a teaching about handovers, its teachings focus on use of the unique Molniya orbit to ensure that a satellite always falls within the beam transmitted by the ground station.

These differences suggest some difficulty in showing a *prima facie* case of obviousness. The Board, however, specifically found that artisans of ordinary skill in this field of art would know to shift the frame of reference from a ground station following a satellite to a satellite transmitting to the ground. According proper deference to the Board's finding of a lofty skill level for ordinary artisans in this field, this court discerns no clear error in the Board's conclusion that these differences would not preclude a finding of obviousness. While Ruddy does not expressly teach alignment of the fan beam with the apparent direction of the satellite's motion, this court perceives no clear error in the Board's determination that Ruddy would suggest such an alignment to one of skill in this art. Therefore, the Board did not err in finding that the combination of King, Rosen, and Ruddy contains all of the elements claimed in

Rouffet's application.

[1] However, the Board reversibly erred in determining that one of skill in the art would have been motivated to combine these references in a manner that rendered the claimed invention obvious. Indeed, the Board did not identify any motivation to choose these references for combination. Ruddy does not specifically address handover minimization. To the extent that Ruddy at all addresses handovers due to satellite motion, it addresses this subject through the selection of orbital parameters. Ruddy does not teach the choice of a particular shape and alignment of the beam projected by the satellite. Thus Ruddy addresses the handover problem with an orbit selection, not a beam shape. The Board provides no reasons that one of ordinary skill in this art, seeking to minimize handovers due to satellite motion, would combine Ruddy with Rosen and King in a manner that would render the claimed invention obvious.

Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. See 35 U.S.C. Section 103(a). This legal construct is akin to the "reasonable person" used as a reference in negligence determinations. The legal construct also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan. See *In re Carlson*, 983 F.2d 1032, 1038, 25 USPQ2d 1207, 1211 (Fed. Cir. 1993).

As this court has stated, "virtually all [inventions] are combinations of old elements." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 698, 218 USPQ 865, 870 (Fed. Cir. 1983); see also *Richdel, Inc. v. Sunspool Corp.*, 714 F.2d 1573, 1579-80, 219 USPQ 8, 12 (Fed. Cir. 1983) ("Most, if not all, inventions are combinations and mostly of old elements."). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. Such an approach would be "an illogical and inappropriate process by which to determine patentability." *Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570, 38 USPQ2d 1551, 1554 (Fed. Cir. 1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to

show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

[2] This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. Rather, just as it relied on the high level of skill in the art to overcome the differences between the claimed invention and the selected elements in the references, it relied upon the high level of skill in the art to provide the necessary motivation. The Board did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the art. If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obviousness construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See *In re Gorman*, 933 F.2d 982, 986, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). Lacking a motivation to combine references, the Board did not show a proper *prima facie* case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy.

### ***The Combination of Freeburg and Levine***

Freeburg teaches a cellular radiotelephone system based on a constellation of low Earth orbit

satellites that use conical beams to transmit from the satellite to both fixed and mobile Earth stations. Levine teaches an Earth-based cellular radio system that uses fan beams broadcast from antenna towers. Levine's elliptical footprints are aligned with the road grid. To increase the capacity of traditional ground-based systems through frequency reuse techniques, Levine teaches the use of antennas that broadcast signals with smaller footprints than the prior art system. Thus, Levine actually increases the number of overlap regions between cells and, hence, the number of potential handovers. Figure 1 of the Levine patent illustrates its alignment of beam footprints:



As a mobile unit (e.g., a driver using a car phone) moves through a succession of overlapping zones, Levine uses selection algorithms to determine which of the cells is aligned with the travel direction of the mobile unit. These algorithms then select this cell for use while continually monitoring intersecting cells in the event that the mobile unit changes direction. Once again, this court notes significant differences between the teachings of the application and the Levine-Freeburg combination. The critical Levine reference again involves a beam from an Earth station without any reference to the "travel direction of [a] satellite." Moreover, Levine actually multiplies the number of potential handovers and then uses software to sort out the necessary handovers from the unnecessary. However, the Board explains the reasons that one possessing the lofty skills characteristic of this field would know to account for the differences between the claimed invention and the prior art combination. This court discerns no clear error in that reliance on the considerable skills in this field.

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[3] This court does, however, discern reversible error in the Board's identification of a motivation to combine Levine and Freeburg. In determining that one of skill in the art would have had motivation to combine Levine and Freeburg, the Board noted that "[t]he level of skill in the art is very high." As noted before, this observation alone cannot supply the required suggestion to combine these references. The Board posits that the high level of skill in the art overcomes the absence of any actual suggestion that one could select part of the teachings of Levine for combination with the satellite system disclosed by Freeburg. As noted above, the suggestion to combine requirement is a safeguard against the use of



hindsight combinations to negate patentability. While the skill level is a component of the inquiry for a suggestion to combine, a lofty level of skill alone does not suffice to supply a motivation to combine. Otherwise a high level of ordinary skill in an art field would almost always preclude patentable inventions. As this court has often noted, invention itself is the process of combining prior art in a nonobvious manner. *See, e.g., Richdel*, 714 F.2d at 1579; *Environmental Designs*, 713 F.2d at 698. Therefore, even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. *Cf. Gechter v. Davidson*, 116 F.3d 1454, 43 USPQ2d 1030 (Fed. Cir. 1997) (explaining that the Board's opinion must describe the basis for its decision). In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.

The Board's naked invocation of skill in the art to supply a suggestion to combine the references cited in this case is therefore clearly erroneous. Absent any proper motivation to combine part of Levine's teachings with Freeburg's satellite system, the rejection of Rouffet's claim over these references was improper and is reversed.

#### IV

The Board reversibly erred in determining that there was a motivation to combine either the teachings of King, Rosen, and Ruddy or of Freeburg and Levine in a manner that would render the claimed invention obvious. Because this predicate was missing in each case, the Board did not properly show that these references render the claimed invention obvious. Therefore this court reverses the Board's decision upholding the rejection of Rouffet's claims. In light of this disposition, Rouffet's pending motion to remand the case to the Board for further consideration is denied as moot.

#### COSTS

Each party shall bear its own costs.

**REVERSED .**

**- End of Case -**

Markman v. Westview Instruments Inc. (CA FC) 34 USPQ2d 1321

**Markman v. Westview Instruments Inc.**

**U.S. Court of Appeals Federal Circuit  
34 USPQ2d 1321**

**Decided April 5, 1995  
No. 92-1049**

**Headnotes**

**JUDICIAL PRACTICE AND PROCEDURE**

**1. Procedure -- New trial; directed verdict; JNOV (§ 410.30)**

**Procedure -- Judicial review -- Standard of review -- In general (§ 410.4607.01)**

Correctness of federal district court's grant of judgment as matter of law is reviewed de novo on

appeal by reapplication of proper standard; factual findings made by jury in arriving at its verdict must be upheld unless moving party shows that there is not substantial evidence to support finding in favor of nonmovant, but legal standards applied by jury are considered de novo to determine whether they are correct as matter of law.

## **PATENTS**

### **2. Patent construction -- In general (§ 125.01)**

## **JUDICIAL PRACTICE AND PROCEDURE**

### **Procedure -- Jury trials (§ 410.42)**

Federal district court, in case tried to jury, has power and obligation to construe as matter of law meaning of language used in patent claim, since fundamental principle of American law holds that construction of written evidence lies exclusively with court, since patent is fully integrated written instrument, and since patent is thus uniquely suited to having its meaning and scope determined entirely by court rather than jury.

## **PATENTS**

### **3. Infringement -- Construction of claims (§ 120.03)**

**Patent construction -- Claims -- Defining terms (§ 125.1305)**

Federal district court properly construed term "inventory," in claims for dry cleaning business inventory control system, to refer at least in part to articles of clothing, rather than being limited solely to cash and inventory receipts of business, since claim language, specification and prosecution history all support such interpretation; extrinsic evidence, including testimony of plaintiff inventor and his patent attorney that meaning of term should be limited to dollars and inventory receipts, does not warrant contrary conclusion, since such testimony is mere legal opinion entitled to no deference, and since extrinsic evidence cannot be relied on to change meaning of claims.

**Particular patents -- Electrical -- Inventory control system**

Re. 33,054 (of 4,550,246), Markman, inventory control and reporting system for dry cleaning stores, judgment as matter of law that claims 1 and 10 are not infringed, affirmed.

**Case History and Disposition:**

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Appeal from the U.S. District Court for the Eastern District of Pennsylvania, Katz, J.; 20 USPQ2d 1955 .

Action by Herbert Markman and Positek Inc. against Westview Instruments Inc. and Althon Enterprises Inc., for patent infringement. From entry of judgment of non-infringement as matter of law following jury verdict of infringement, plaintiffs appeal. Affirmed; Mayer and Rader, JJ., concurring in separate opinions; Newman, J., dissenting.

**Attorneys:**

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**Judge:**

Before Archer, chief judge, \* and Rich, Nies, Newman, Mayer, Michel, Plager, Lourie, Cleverger, Rader, and Schall, circuit judges. †

**Opinion Text**

**Opinion By:**

Archer, C.J.

Herbert Markman and Positek, Inc. (collectively referred to as Markman) appeal from the judgment of the United States District Court for the Eastern District of Pennsylvania, Civil Action No. 91-0940 (entered Oct. 1, 1991), that Westview Instruments, Inc. and Althon Enterprises, Inc. (collectively referred to as Westview) did not infringe claims 1 or 10 of United States Reissue Patent No. 33,054, notwithstanding the jury's verdict to the contrary. We have ordered that this case be reheard in banc. 1 We affirm the judgment of noninfringement. In doing so, we conclude that the interpretation and construction of patent claims, which define the scope of the patentee's rights under the patent, is a matter of law exclusively for the court. Thus, in this case the district court properly discharged its obligation to delineate the scope of the claim on motion for judgment as a matter of law when the jury had rendered a verdict that was incompatible with a proper claim construction.

## I.

A. In the dry-cleaning industry, articles of clothing typically are taken in from customers, recorded in some form, and then sorted according to criteria such as type of clothing and type of cleaning required. During the sorting process, articles of clothing belonging to one customer may be combined together, and also may be combined with similar clothing belonging to other customers, in order to make the cleaning process more efficient and less costly. After the articles of clothing are sorted, they may be cleaned in the same establishment or transported to another establishment for cleaning. During the cleaning process, the articles of clothing move through different locations in the establishment. After cleaning, of course, the articles of clothing must be unsorted and returned to the respective customers.

Markman is the inventor named in and the owner of United States Reissue Patent No. 33,054 (the '054 patent), titled "Inventory Control and Reporting System for Drycleaning Stores."

Markman's original patent No. 4,550,246 was reissued and the reissue is the patent in suit.

Positek is a licensee under the patent in the dry-cleaning business.

The '054 patent is directed to an inventory-control system that assertedly solves inventory-related problems prevalent in the dry-cleaning business. As the '054 patent specification discusses, articles of clothing can be lost in the sorting and cleaning process, and it has been found in the dry-cleaning business that even a small percentage-loss of articles of clothing will generate great consumer dissatisfaction. Also, attendant personnel might send clothing through the cleaning process but pocket the proceeds of the transactions and destroy or fail to do the appropriate paperwork, thereby servicing the customers adequately but stealing from the business. In such circumstances it is difficult for the business owner to locate the loss of profits and to deter such activities.

The invention of the '054 patent is described in detail in the specification which states that the inventory control system is "capable of monitoring and reporting upon the status, location and throughput of inventory in an establishment," and that by using

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the invention of the '054 patent, "the progress of articles through the laundry and drycleaning system can be completely monitored." In this way, the business owner can "reconcile[] [the



inventory] at any point in the sequence" of sorting, cleaning, and unsorting clothing, and can "detect and localize spurious additions to inventory as well as spurious deletions therefrom."

According to the specification's description of the invention, as customers bring in their articles of clothing for cleaning, the articles are accumulated by an attendant. The attendant enters information on a keyboard identifying at least the particular customer, the type of articles being deposited, and the particular cleaning operations to be performed. Other information may be entered depending upon the complexity of the system.

A data processor stores and processes the data entered by the attendant, associating sequential customers and transactions with a unique indicium such as a number. The processor is connected to a printer that generates a written record of the stored information associated with the particular customers and transactions. No transaction can proceed without generating a written record, thereby ensuring that each transaction is accounted for.

The patent specification specifies that the written record is to have different portions. For example, the written record includes a customer ticket or receipt, a management ticket copy, and a plurality of article tags. The article tags are to be attached to individual articles or groups of articles in inventory. The management ticket and the article tags contain a bar code and a unique indicium such as a number associated with a customer, transaction, and other information. The bar code records are custom printed sequentially, as sequential customer transactions occur. The tags thus not only associate a bar code with transactions, but also with an article or group of articles, persons, physical items in inventory, and other information again depending upon the system's complexity.

Optical detector devices are then used to read the bar code indicia, and they may be located at various points in the cleaning process, including at least at the customer service station. The articles are logged through a particular station by scanning the tags containing the bar codes with the detector. The bar codes are used to call up information associated with the customer or transaction, and used to generate reports containing information such as the location of articles within the system, the number of articles located at a particular point in the system, etc. Obviously, the more optical detectors, the tighter the inventory control. After the articles have been processed, optical detection of the bar codes can be used to reorganize the articles into customer packages. The overall result is that additions to and deletions from inventory can be located -- wherever an optical detector appears -- and can be associated with particular customers and articles of clothing. In this way the inventory can be fully reconciled.

In claim 1, the only independent claim involved in this appeal, Markman claims his invention to be (emphasis added):

1. The inventory control and reporting system, comprising:  
a data input device for manual operation by an attendant, the input device having switch means operable to encode information relating to sequential transactions, each of the transactions having articles associated therewith, said information including transaction identity and *descriptions of each of said articles* associated with the transactions;  
a data processor including memory operable to record said information and *means to maintain an inventory total*, said data processor having means to associate sequential transactions with unique sequential indicia and *to generate at least one report of said total* and said transactions, the unique sequential indicia and the descriptions of articles in the sequential transactions being reconcilable against one another;  
a dot matrix printer operable under control of the data processor to generate a written record of the indicia associated with sequential transactions, the written record including optically-detectable bar codes having a series of contrasting spaced bands, the bar codes being printed only in coincidence with each said transaction and at least part of the written record bearing a portion *to be attached to said articles*; and,  
at least one optical scanner connected to the data processor and operable to detect said bar codes *on all articles* passing a predetermined station,  
whereby said system can detect and *localize spurious additions to inventory* as well as spurious deletions therefrom.

In dependent claim 10, Markman specifies that in the invention of claim 1, the input device is an alpha-numeric keyboard wherein single keys may be used to enter attributes of items being entered.

B. Markman sued Westview and Althon for infringement of claims 1, 10, and 14 of

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the '054 patent. Westview makes and sells specialty electronic devices, including the system accused of being an infringement of the '054 patent. Althon owns and operates two dry-cleaning sites and uses Westview's device in one of its shops.

The accused Westview device consists of two separate pieces of equipment, which Westview

calls the DATAMARK and the DATASCAN. The DATAMARK is a stationary unit comprising a keyboard, electronic display, processor, and printer. When a customer brings articles of clothing in for cleaning, an attendant enters on a keypad information about the customer, articles to be cleaned, and charges for the cleaning. The DATAMARK then prints a bar-coded ticket or invoice listing the information about the customer, the clothes to be cleaned, and the charges for the cleaning. The DATAMARK retains permanently in memory only the invoice number, date, and cash total. The DATAMARK is thus used to print bar-coded tickets for the articles and to retain an invoice list.

The DATASCAN is a portable unit comprising a microprocessor and an optical detector for reading bar-coded tickets or invoices at any location in the dry-cleaning establishment. To use the DATASCAN, first the invoice list is transferred from the DATAMARK to the DATASCAN. Then, the DATASCAN is carried about to read the bar-codes on tickets or invoices in the establishment. As it does this, it can report any discrepancy between the particular invoice read (or not read) and the invoice list. In this way the DATASCAN identifies extra or missing *invoices*.

C. At a jury trial on the issue of infringement, Markman presented the testimony of four witnesses: (1) an expert on bar-code technology who testified about the manner in which Westview's device operates, (2) Markman, the inventor, who testified about his patent and its claims, (3) a "patent expert" -- that is, a practicing patent lawyer -- who testified in his capacity as a patent lawyer about the meaning of the claim language and how the claims allegedly read on the accused system, (4) an accountant who testified as to the number of allegedly infringing systems sold. Also included in evidence were the actual Westview device and its operating manuals, brochures, and computer program. At the conclusion of Markman's case in chief, Westview moved for a directed verdict. <sup>2</sup> The district court deferred ruling on the motion. Westview then presented the testimony of a single witness, its president, who demonstrated the operation of the Westview device and testified about its capabilities.

The district court charged the jury on infringement, instructing it to "determine the meaning of the claims . . . using the relevant patent documents including the specifications, the drawings and the file histories." The court continued that "[a]lso relevant are other considerations that show how the terms of a claim would normally be understood by those of ordinary skill in the art." The court then instructed the jury to compare the claims with the Westview device to determine if it infringes. The jury returned answers to general interrogatories finding that Westview

infringed independent claim 1 and dependent claim 10 but did not infringe independent claim 14. 3

The district court then heard argument on and granted Westview's deferred motion for judgment as a matter of law (JMOL). Stating that claim construction was a matter of law for the court, the district court provided its construction of the claims. The court held that "inventory" as used in the claims meant "articles of clothing" and not simply transaction totals or dollars. Under the district court's construction, the claims require that the system be able to track articles of clothing through the dry-cleaning process, detect and localize missing and additional articles of clothing, and generate reports about the status and location of the articles of clothing. It is undisputed that Westview's system is incapable of doing this because it does not retain information regarding the particular articles of clothing, but rather only a listing of the invoices and the cash total of the inventory. Among other things, the court concluded that Westview's device does not have the "means to maintain an inventory total" required by claim 1, and cannot "detect and localize spurious additions to inventory as well as spurious deletions therefrom," and directed a verdict of noninfringement of claims 1 and 10.

## II.

A. Markman appealed from the district court's grant of JMOL of noninfringement of claims 1 and 10. In this court, Markman's principal argument is that the district court erred in granting the JMOL, stating:

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Requiring the jury to interpret certain terms of the patent was quite proper, and indeed required, as the meaning of certain terms of Claim 1 was contested at trial. *See Polumbo v. Don-Joy Co.* [ sic. ], 762 F.2d 969, 974, 226 USPQ 5, 8 (Fed. Cir. 1985) (when the meaning of a claim term is disputed a "factual question arises, and construction of the claim should be left to the trier or jury under appropriate instruction.")

....  
Despite entrusting the jury with interpreting the claim, the trial court thwarted [Markman's] right to a jury determination of this factual issue simply because it disagreed with the jury's

interpretation. At the root of the district court's astonishing opinion was its mistaken belief that it had a license to re-find the facts and reinterpret the claims as if there were no jury and no jury verdict because, in different appropriate cases, claims of a patent may be interpreted as a matter of law. . . .

. . . Indeed the deference due to a jury's claim construction was stated positively by this court in *Tol-O-Matic [ ], Inc. v. Proma Produkt-Und Marketing Gesellschaft m.b.H.* , 945 F.2d 1546, 1550-52, 20 USPQ2d 1332, 1336-38 (Fed. Cir. 1991).]. . .

. . . .  
. . . While in appropriate circumstances, claims may be interpreted as a matter of law by the court, in this case the jury was asked to and did interpret the patent as part of reaching its finding of infringement. Once the jury was assigned this task and rendered its verdict, the trial court was not permitted to discredit the verdict and substitute its evaluation of the evidence for the jury's. In particular, Markman argues that the district court erroneously substituted its construction of the disputed claim term "inventory" for the jury's implied construction.

As the above quotation shows, Markman contends that the jury was properly given the question of claim construction and that the jury's claim construction and verdict thereon is supported by substantial evidence. The evidence Markman points to in support of the jury verdict is not the language of the patent specification or prosecution history, but rather Markman's own testimony as inventor and the testimony of his patent expert. He also relies on use of the word "inventory" in Westview's product literature and on the testimony of its president. Markman's position essentially is that all the evidence of the meaning of the word "inventory," from the patent, prosecution history, experts, and documents, was properly lumped together and submitted to the jury for it to resolve what in fact is the meaning of "inventory," and that the result of this process is entitled to highly deferential review both by the trial court on motion for JMOL and by this court on appeal from the grant or denial of JMOL.

Setting aside the issue of who properly determines the ultimate scope of the claims, Markman further argues that the district court misconstrued the term "inventory" to mean "articles of clothing" in addition to "cash" or "invoice totals" in order to find that claim 1 defines a system that "tracks" articles of clothing through the dry-cleaning process. Markman says that based on all the evidence presented at trial the term "inventory" as used in claim 1 means "articles of clothing" or "dollars" or "cash" or "invoices," and is not necessarily limited to a construction that always includes "articles of clothing."

Westview on the other hand focuses almost exclusively on the patent and prosecution history to inform the meaning of "inventory." It argues that the patent and prosecution history are in conflict with the testimony and other evidence relied on by Markman and therefore Markman's evidence should be disregarded by the court in favor of the meaning revealed by the patent. This task of assigning the meaning to "inventory," and the meaning assigned are, in the view of Westview, all legal matters for the court and subject to *de novo* review.

It is undisputed that when the claim term "inventory" is construed to mean "the physical articles of clothing" or to require "articles of clothing" as part of its meaning, the Westview system lacks "means to maintain an inventory total" and does not and cannot "detect and localize spurious additions to inventory as well as spurious deletions therefrom," as claim 1 would thus require. 4 Markman's appeal therefore turns on (1) whether the district court acted properly by construing the term "inventory" as a matter of law notwithstanding a contrary construction given the term by some of Markman's witnesses and by the jury, and (2) regardless of whether the court or the jury determines the scope of the claims, whether the term

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"inventory" requires as part of its meaning "articles of clothing."

[1] B. Where a party moves for JMOL in a case that has been tried to a jury, the district court must determine whether there exists evidence of record upon which a jury might properly have returned a verdict in [the non-movant's] favor when *the correct legal standard is applied*. If there is not, [the movant] was entitled to have the question removed from the jury and decided as a matter of law.

*Jamesbury Corp. v. Litton Indus. Prods., Inc.*, 756 F.2d 1556, 1560, 225 USPQ 253, 257 (Fed. Cir. 1985) (emphasis added). On appeal, we review *de novo* the correctness of the district court's grant of JMOL by reapplying the JMOL standard. *Id.*; see *Newell Cos. v. Kenney Mfg. Co.*, 864 F.2d 757, 762, 9 USPQ2d 1417, 1421 (Fed. Cir. 1988).

Embedded within the above description of JMOL are two aspects. Factual findings made by the jury in arriving at its verdict are to be upheld unless the party moving for JMOL shows that (when the correct legal standard is applied) there is not substantial evidence to support a finding in favor of the nonmovant. See *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 821, 23 USPQ2d 1426, 1431 (Fed. Cir. 1992).

While the jury's factual findings receive substantial deference on motion for JMOL, the legal standards that the jury applies, expressly or implicitly, in reaching its verdict are considered by the district court and by the appellate court *de novo* to determine whether those standards are correct as a matter of law. *Baltimore & Carolina Line, Inc. v. Redman*, 295 U.S. 654, 660 (1935) (" [A] federal court may take a verdict subject to the opinion of the court on a question of law. . . ."); *Read Corp.*, 970 F.2d at 821, 23 USPQ2d at 1431; *see Elder v. Holloway*, 114 S. Ct. 1019, 1023 (1994) (" [Q]uestion [s] of law . . . must be resolved *de novo* on appeal."); *Bradley v. Secretary of Health and Human Servs.*, 991 F.2d 1570, 1574 n.3 (Fed. Cir. 1993) ("Legal conclusions are, of course, always reviewed *de novo* ."); *Heisig v. United States*, 719 F.2d 1153, 1158 (Fed. Cir. 1983); *see also Bose Corp. v. Consumers Union of United States, Inc.*, 466 U.S. 485, 501 (1984) ("[A]n appellate court[] [has] power to correct errors of law, including those that may infect a so-called mixed finding of law and fact, or a finding of fact that is predicated on a misunderstanding of the governing rule of law."). Notwithstanding the jury's verdict, on review of a motion for JMOL the court retains the power and duty to say what the correct law is, and then to examine the factual issues submitted to the jury and determine whether findings thereon are supported by substantial evidence and support the verdict under the law. *Read Corp.*, 970 F.2d at 821, 23 USPQ2d at 1431; *Senmed, Inc. v. Richard-Allan Medical Indus., Inc.*, 888 F.2d 815, 818, 12 USPQ2d 1508, 1511 (Fed. Cir. 1989); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1550, 220 USPQ 193, 200 (Fed. Cir. 1983). 5

Since matters of law must be reviewed *de novo* and matters of fact must be accorded substantial deference, the review of a grant of JMOL requires careful distinction between fact and law. In this case which involves claim construction and a grant of JMOL of noninfringement based on claim construction, in order to determine whether that grant was correct, we must distinguish law from fact.

C. An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. *Read Corp.*, 970 F.2d at 821, 23 USPQ2d at 1431. The second step is comparing the properly construed claims to the device accused of infringing. *Id.* It is the first step, commonly known as claim construction or interpretation, 6 that is at issue in this appeal.

### III.

A. The opinions of this court have contained some inconsistent statements as to whether and to what extent claim construction is a legal or factual issue, or a mixed issue. Markman cites some of our cases which have statements that claim construction may be a factual or mixed issue, including *Tol-O- Matic, Inc. v. Proma Produkt-Und Mktg. Gesellschaft m.b.H.* , 945 F.2d 1546, 1550-52, 20 USPQ2d 1332, 1336-38 (Fed. Cir. 1991), and *Palumbo v. Don-Joy Co.* , 762 F.2d 969, 974, 226 USPQ 5, 8 (Fed. Cir. 1985).

At its inception, the Federal Circuit held that claim construction was a matter of law. Our first opinion deciding a question of claim construction, *SSIH Equip. S.A. v. United States Int'l Trade Comm'n* , 718 F.2d 365, 376, 218 USPQ 678, 688 (Fed. Cir. 1983) (originally reported at 713 F.2d 746-60), said so explicitly, resting on the authority of *Winans v. Denmead* , 56 U.S. (15 How.) 330 (1854). Cases following *SSIH* include *Kalman v. Kimberly-Clark Corp.* , 713 F.2d 760, 770-71, 218 USPQ 781, 788 (Fed. Cir. 1983), and *Fromson v. Advance Offset Plate, Inc.* , 720 F.2d 1565, 1569-71, 219 USPQ 1137, 1140-42 (Fed. Cir. 1983), and *SRI Int'l v. Matsushita Elec. Corp. of America* , 775 F.2d 1107, 1118-22, 1138- 40, 227 USPQ 577, 583-86, 596-97 (Fed. Cir. 1985) (in banc).

The first Federal Circuit case to deviate from this precedent and state that claim construction may have underlying factual inquiries that must be submitted to a jury was *McGill Inc. v. John Zink Co.* , 736 F.2d 666, 221 USPQ 944 (Fed. Cir. 1984). In *McGill* , the court stated that [i]f . . . the meaning of a term of art in the claims is disputed and extrinsic evidence is needed to explain the meaning, construction of the claims could be left to a jury. *Envirotech Corp. v. Al George, Inc.* , 730 F.2d 753 (Fed. Cir. 1984); cf. *Hong Kong Export Credit Insurance Corp. v. Dun & Bradstreet* , 414 F. Supp. 153, 157 (S.D.N.Y. 1975). In the latter instance, the jury cannot be directed to the disputed meaning for the term of art. Cf. *Butler v. Local Union 823, International Brotherhood of Teamsters* , 514 F.2d 442, 452 (8th Cir.), cert. denied , 423 U.S. 924, 96 S.Ct. 265, 46 L.Ed.2d 249 (1975).

*Id.* at 672, 221 USPQ at 948. A review of the authority relied on for this statement of law, however, is revealing. In contradistinction to the proposition for which it is cited, *Envirotech* in fact states "[t]he patented invention as indicated by the language of the claims must first be



defined ( *a question of law* ), and then the trier must judge whether the claims cover the accused device (a question of fact)." *Id.* at 758, 221 USPQ at 477 (emphasis added). Thus *Envirotech* is entirely consistent with the earlier precedent. 7 The other two cases relied upon, the district court opinion in *Hong Kong Export Credit* and the Eighth Circuit opinion in *Butler* , are contract cases. Thus this court's earliest pronouncement of jury triable fact issues in claim construction cites no authoritative support.

Cases following the *McGill* view of claim construction provide no firmer basis for the view. Nevertheless, a significant line of cases has developed in our precedent stating (although rarely holding) that there may be jury triable fact issues in claim construction, relying on *McGill* (and its erroneous interpretation of *Envirotech* ) and its progeny. See *Bio-Rad Labs, Inc. v. Nicolet Instrument Corp.* , 739 F.2d 604, 614, 222 USPQ 654, 661 (Fed. Cir. 1984) (relying on *Envirotech* ); *Palumbo v. Don-Joy Co.* , 762 F.2d 969, 974, 226 USPQ 5, 8 (Fed. Cir. 1985) (no authority cited); 8 *Moeller v. Ionetics, Inc.* , 794 F.2d 653, 657, 229 USPQ 992, 995 (Fed. Cir. 1986) (citing *Palumbo* ); *H.H. Robertson, Co. v. United Steel Deck, Inc.* , 820 F.2d 384, 389, 2 USPQ2d 1926, 1929 (Fed. Cir. 1987) (citing *Moeller* and *Palumbo* ); *Perini America, Inc. v. Paper Converting Machine Co.* , 832 F.2d 581, 584, 4 USPQ2d 1621, 1624 (Fed. Cir. 1987) (citing *Palumbo* and *McGill* ). The language from these opinions, to the effect that disputes over the meaning of claim language may raise factual questions reviewed for substantial evidence or clear error as the case may be, continued to propagate through our precedent. This line of cases culminated in *Tol-O-Matic, Inc. v. Proma Produkt-Und Mktg. Gesellschaft m.b.H.* , 945 F.2d 1546, 20 USPQ2d 1332 (Fed. Cir. 1991), in which this court affirmed a denial of a motion for judgment n.o.v., reasoning that

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[i]nterpretation of the claim words [at issue] required that the jury give consideration and weight to several underlying factual questions, including in this case the description of the claimed element in the specification, the intended meaning and usage of the claim terms by the patentee, what transpired during the prosecution of the patent application, and the technological evidence offered by the expert witnesses.

*Id.* at 1550, 20 USPQ2d at 1336.

On the other hand, a second line of Federal Circuit opinions has continued to follow the earlier pronouncements that claim construction is strictly a question of law for the court. See *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 986, 6 USPQ2d 1601, 1604 (Fed. Cir. 1988); *Senmed*, 888 F.2d at 818-20, 12 USPQ2d at 1511-13; *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1561-63, 19 USPQ2d 1500, 1503-04 (Fed. Cir. 1991); *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-88, 21 USPQ2d 1383, 1386 87 (Fed. Cir. 1992); *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 822-23, 23 USPQ2d 1426, 1432-33 (Fed. Cir. 1992).

B. Notwithstanding the apparent inconsistencies in our opinions, the Supreme Court has repeatedly held that the construction of a patent claim is a matter of law exclusively for the court. *Hogg v. Emerson*, 47 U.S. (6 How.) 437, 484 (1848); *Silsby v. Foote*, 55 U.S. (14 How.) 218, 225 (1853); *Winans v. Denmead*, 56 U.S. (15 How.) at 338; *Winans v. New York & Erie R.R. Co.*, 62 U.S. (21 How.) 88, 100 (1859); *Bischoff v. Wethered*, 76 U.S. (9 Wall.) 812, 816 (1870); *Heald v. Rice*, 104 U.S. 737, 749 (1882); *Coupe v. Royer*, 155 U.S. 565, 579-80 (1895); *Market St. Cable Ry. Co. v. Rowley*, 155 U.S. 621, 625 (1895); *Singer Mfg. Co. v. Cramer*, 192 U.S. 265, 275 (1904); see also 2 William C. Robinson, *The Law of Patents for Useful Inventions* Section 731, at 481 (1890) (hereinafter Robinson on Patents); George T. Curtis, *A Treatise on the Law of Patents for Useful Inventions* Section 222, at 251 (4th ed. 1873) (hereinafter *Curtis on Patents*). 9 Time and again the Supreme Court has itself resolved disputes over the construction of claims as a matter of law. See, e.g., *Coupe v. Royer*, 155 U.S. at 574-75, 579 (stating that court defines the scope of the claims and reversing the trial judge's erroneous claim construction); *Keystone Bridge Co. v. Phoenix Iron Co.*, 95 U.S. 274, 275 (1877) (resolving claim construction contentions on the basis of an exhaustive review of the patent and its discussion of the relevant art).

[2] The reason that the courts construe patent claims as a matter of law and should not give such task to the jury as a factual matter is straightforward: It has long been and continues to be a fundamental principle of American law that "the construction of a written evidence is exclusively with the court." *Levy v. Gadsby*, 7 U.S. (3 Cranch) 180, 186 (1805) (Marshall, C.J.); *Eddy v. Prudence Bonds Corp.*, 165 F.2d 157, 163 (2d Cir. 1947) (Learned Hand, J.) ("[A]ppellate courts have untrammelled power to interpret written documents."); 4 Samuel Williston, *Williston on Contracts* Section 601, at 303 (3d ed. 1961) (hereinafter *Williston on Contracts*) ("Upon countless occasions, the courts have declared it to be the responsibility of

the judge to interpret and construe written instruments, whatever their nature.") (footnotes omitted).

The patent is a fully integrated written instrument. By statute, the patent must provide a written description of the invention that will enable one of ordinary skill in the art to make and use it. 35 U.S.C. Section 112, para. 1. Section 112, para. 2, also requires the applicant for a patent to conclude the specification with claims "particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." It follows, therefore, from the general rule applicable to written instruments that a patent is uniquely suited for having its meaning and scope determined entirely by a court as a matter of law. *Bates v. Coe*, 98 U.S. at 38 (" [T]he claims of the patent, like other provisions in writing, must be reasonably construed. . ."); *Merrill v. Yeomans*, 94 U.S. 568, 571 (1877) (construing the patent in part by applying "well-settled rules of construing all instruments"); accord *Doble Eng'g Co. v. Leeds & Northrup Co.*, 134 F.2d 78, 83, 56 USPQ 426, 432 (1st Cir. 1943) ("It appears to be firmly established that . . . a patent is subject to the same general rules of construction as any other written instrument."); 2 *Robinson on Patents*, *supra*, Section 732, at 481-82; 1 Anthony W. Deller, *Patent Claims* Section 21 (2d ed. 1971).

There is much wisdom to the rule that the construction of a patent should be a legal matter for a court. A patent is a government grant of rights to the patentee. 35 U.S.C. Section 154. By this grant, the patentee owns the

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rights for a limited time to exclude others from making, using, or selling the invention as claimed. *Id.*; see *Bloomer v. McQuewan*, 55 U.S. (14 How.) 539, 548 (1852).

Infringement of the patentee's right to exclude carries with it the potential for serious consequences: The infringer may be enjoined and required to pay increased damages, costs and attorney fees. See 35 U.S.C. Section 283-285. When a court construes the claims of the patent, it "is as if the construction fixed by the court had been incorporated in the specification," *Curtis on Patents*, *supra*, Section 452, at 609, and in this way the court is defining the federal legal rights created by the patent document.

Further, it is only fair (and statutorily required) that competitors be able to ascertain to a reasonable degree the scope of the patentee's right to exclude. *Merrill v. Yeomans*, 94 U.S. at

573-74 ("It seems to us that nothing can be more just and fair, both to the patentee and to the public, than that the former should understand, and correctly describe, just what he has invented, and for what he claims a patent."); *Hogg v. Emerson* , 47 U.S. (6 How.) at 484. They may understand what is the scope of the patent owner's rights by obtaining the patent and prosecution history -- "the undisputed public record," *Senmed* , 888 F.2d at 819 n.8, 12 USPQ2d at 1512 n.8 -- and applying established rules of construction to the language of the patent claim in the context of the patent. Moreover, competitors should be able to rest assured, if infringement litigation occurs, that a judge, trained in the law, will similarly analyze the text of the patent and its associated public record and apply the established rules of construction, and in that way arrive at the true and consistent scope of the patent owner's rights to be given legal effect.

Arriving at a true and consistent scope of the claims also works to the benefit of the patentee, as Professor Robinson eloquently observed:

To treat the nature of the patented invention as a matter of fact, to be inquired of and determined by a jury, would at once deprive the inventor of the opportunity to obtain a permanent and universal definition of his rights under the patent, and in each case of infringement it would subject him to the danger of false interpretation, from the consequences of which he could not escape. By confiding this duty to the court, however, its decision as to the nature of the patented invention becomes reviewable to the same extent as any other legal question, and when his patent has received the interpretation of the Supreme Court of the United States the inventor can maintain his privilege, as thus interpreted, against all opponents without further controversy in reference to its true limitations.

2 *Robinson on Patents* , *supra* , Section 733, at 483-84.

We therefore settle inconsistencies in our precedent and hold that in a case tried to a jury, the court has the power and obligation to construe as a matter of law the meaning of language used in the patent claim. As such, "[a] patent covers the invention or inventions which the court, in construing its provisions, decides that it describes and claims." 3 *Robinson on Patents* , *supra* , Section 1019, at 247. Because claim construction is a matter of law, the construction given the claims is reviewed *de novo* on appeal. Accordingly, Markman's principal argument that the district court erred in taking the issue of claim construction away from the jury is itself legally erroneous.

#### IV.

A. Markman argues that the jury's implied construction of the claims is correct and that the district court's construction of the claims is wrong, thereby necessitating that this court reinstate the jury's verdict. Markman contends that the jury properly considered all the evidence of record on the disputed claim term "inventory" in reaching its implicit conclusion that the term does not require articles of clothing. We find that these arguments are not convincing and we reach a conclusion that is in accord with the district court's construction of the claims.

"To ascertain the meaning of claims, we consider three sources: The claims, the specification, and the prosecution history." *Unique Concepts, Inc. v. Brown*, 939 F.2d 1558, 1561 [ 19 USPQ2d 1500 ] (Fed. Cir. 1991); accord *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 396-98, 155 USPQ 697, 701-03 (Ct. Cl. 1967). "Expert testimony, including evidence of how those skilled in the art would interpret the claims, may also be used." *Fonar Corp. v. Johnson & Johnson*, 821 F.2d 627, 631 [ 3 USPQ2d 1109 ] (Fed. Cir. 1987). In construing the claims in this case, all these sources, as well as extrinsic evidence in the form of Westview's sales literature, were included in the record of the trial court proceedings.

Claims must be read in view of the specification, of which they are a part. *Autogiro*, 384 F.2d at 397, 155 USPQ at 702; see *Winans v. Denmead*, 56 U.S. (15 How.) at 338; *Bates v. Coe*, 98 U.S. at 38-39. The

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specification contains a written description of the invention that must enable one of ordinary skill in the art to make and use the invention. For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. See *In re Vogel*, 422 F.2d 438, 441, 164 USPQ 619, 621 (CCPA 1970) ("Occasionally the disclosure will serve as a dictionary for terms appearing in the claims, and in such instances the disclosure may be used in interpreting the coverage of the claim."). As we have often stated, a patentee is free to be his own lexicographer. *Autogiro*, 384 F.2d at 397, 155 USPQ at 702. The caveat is that any special definition given to a word must be clearly defined in the specification. *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1388, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992). The written description part of the specification itself does not delimit the right to exclude. That is the function and purpose of claims.

To construe claim language, the court should also consider the patent's prosecution history, if it

is in evidence. *Graham v. John Deere Co.*, 383 U.S. 1, 33, 148 USPQ 459, 473 (1966). This "undisputed public record" of proceedings in the Patent and Trademark Office is of primary significance in understanding the claims. See *Autogiro*, 384 F.2d at 397, 155 USPQ at 702 (the "file wrapper" is "part [ ] of the patent"). The court has broad power to look as a matter of law to the prosecution history of the patent in order to ascertain the true meaning of language used in the patent claims:

Th [e] construction of the patent is confirmed by the avowed understanding of the patentee, expressed by him, or on his half [sic], when his application for the original patent was pending. . . [W]hen a patent bears on its face a particular construction, inasmuch as the specification and claim are in the words of the patentee, . . . such a construction may be confirmed by what the patentee said when he was making his application.

*Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222, 227 (1880); see *Singer Mfg. Co.*, 192 U.S. at 278-85 (construing the claims in light of the prosecution history as a matter of law). 10 Although the prosecution history can and should be used to understand the language used in the claims, it too cannot "enlarge, diminish, or vary" the limitations in the claims.

*Goodyear Dental Vulcanite Co.*, 102 U.S. at 227; *Intervet Am., Inc. v. Kee-Vet Labs., Inc.*, 887 F.2d 1050, 1054, 12 USPQ2d 1474, 1477 (Fed. Cir. 1989).

Extrinsic evidence consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises. This evidence may be helpful to explain scientific principles, the meaning of technical terms, and terms of art that appear in the patent and prosecution history. Extrinsic evidence may demonstrate the state of the prior art at the time of the invention. It is useful "to show what was then old, to distinguish what was new, and to aid the court in the construction of the patent." *Brown v. Piper*, 91 U.S. 37, 41 (1875).

The court may, in its discretion, receive extrinsic evidence in order "to aid the court in coming to a correct conclusion" as to the "true meaning of the language employed" in the patent. *Seymour v. Osborne*, 78 U.S. (11 Wall.) 516, 546 (1871) (reviewing a decree in equity); see *United Carbon Co. v. Binney & Smith Co.*, 317 U.S. 228, 233, 55 USPQ 381, 384 (1942) (the court construed the claim by relying in part on the testimony of one of the patentees as the "clearest exposition of the significance which the terms employed in the claims had for those skilled in the art"); *U.S. Indus. Chems., Inc. v. Carbide & Carbon Chems. Corp.*, 315 U.S. 668, 678, 53 USPQ 6, 10 (1942) (" [I]t is permissible, and often necessary, to receive expert

evidence to ascertain the meaning of a technical or scientific term or term of art so that the court may be aided in understanding . . . what [the instruments] actually say."); *Winans v. New York & Erie R.R. Co.* , 62 U.S. (21 How.) at 101 (" [P]rofessors or mechanics cannot be received to prove to the court or

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jury what is the proper or legal construction of any instrument of writing. A judge may obtain information from them, if he desire it, on matters which he does not clearly comprehend, but cannot be compelled to receive their opinions as matter of evidence."); *Marsh v. Quick-Meal Stove Co.* , 51 F. 203 (C.C.D. Mo. 1892) ("It is the province of the court to construe the claims of the patent that has been offered in evidence. That construction, of course, is to be made in the light of such expert testimony as has been offered."); 3 *Robinson on Patents* , *supra* , Sections 1012-15, 1019-20; *accord Seattle Box Co. v. Industrial Crating & Packing, Inc.* , 731 F.2d 818, 826, 221 USPQ 568, 573 (Fed. Cir. 1984) ("A trial judge has sole discretion to decide whether or not he needs, or even just desires, an expert's assistance to understand a patent. We will not disturb that discretionary decision except in the clearest case."); *Advanced Cardiovascular Sys., Inc. v. Scimed Life Sys., Inc.* , 887 F.2d 1070, 1076, 12 USPQ2d 1539, 1544 (Fed. Cir. 1989) (Newman, J., dissenting) ("The purpose of expert testimony is to provide *assistance to the court* in understanding, when the claims are technologically complex or linguistically obscure, how a technician in the field, reading the patent, would understand the claims.") (emphasis added).

Extrinsic evidence is to be used for the court's understanding of the patent, not for the purpose of varying or contradicting the terms of the claims. *U.S. Indus. Chems., Inc.* , 315 U.S. at 678, 53 USPQ at 10; *Catalin Corp. of Am. v. Catalazuli Mfg. Co.* , 79 F.2d 593, 594, 27 USPQ 371, 373 (2d Cir. 1935) (Learned Hand, J.) ("If the doctrine of the 'integration' of a written instrument has any basis at all, surely it should apply to such a document . . . [as the patent]."); 3 *Robinson on Patents* , *supra* , Section 1019, at 247-48. When, after considering the extrinsic evidence, the court finally arrives at an understanding of the language as used in the patent and prosecution history, the court must then pronounce as a matter of law the meaning of that language. See *Loom Co. v. Higgins* , 105 U.S. at 586. This ordinarily can be accomplished by the court in framing its charge to the jury, but may also be done in the context of dispositive

motions such as those seeking judgment as a matter of law.

Through this process of construing claims by, among other things, using certain extrinsic evidence that the court finds helpful and rejecting other evidence as unhelpful, and resolving disputes *en route* to pronouncing the meaning of claim language as a matter of law based on the patent documents themselves, the court is *not* crediting certain evidence over other evidence or making factual evidentiary findings. Rather, the court is looking to the extrinsic evidence to assist in its construction of the written document, a task it is required to perform.

11 The district court's claim construction, enlightened by such extrinsic evidence as may be helpful, is still based upon the patent and prosecution history. It is therefore still construction, and is a matter of law subject to *de novo* review.

B. Applying this analysis of claim construction, we conclude that (1) the trial court did not abuse its discretion when it admitted the extrinsic evidence offered by Markman -- Markman's testimony and the testimony of Markman's "patent expert" -- on the issue of claim construction, and that (2) the trial court properly rejected this extrinsic evidence to the extent it contradicted the court's construction of the claims based on the specification and prosecution history.

Although in this case the trial court might have granted Westview's motion for directed verdict and should have instructed the jury as to the meaning of the claims (including the disputed term "inventory"), its failure to do so was rendered harmless by the court's subsequent response to Westview's post-trial motion.

[3] We agree with the trial court that the term "inventory" refers, at least in part, to articles of clothing, contrary to Markman's contention that "inventory" may be limited to just cash or inventory receipts. As the district court noted, the claim phrase "detect and localize spurious additions to inventory as well as spurious deletions therefrom" does not make sense using Markman's definition of "inventory." Dollars or invoice totals are not "localized" since dollars do not travel through the cleaning process and the location of invoices is irrelevant. Location is relevant to clothing, since it moves through and sometimes without the establishment, where it can be lost, stolen, or damaged. Also, "spurious" additions and deletions logically relate to clothing because "dollars" would not be spuriously added to a dry-cleaner's inventory. Thus, the language of the claim itself suggests the conclusion that the dry-cleaner's "inventory" includes clothing.

The patent specification confirms this. The specification is pervasive in using the



term "inventory" to consist of "articles of clothing." Rather than set forth each instance, we refer the reader to a few examples:

This invention relates to inventory control devices capable of monitoring and reporting upon the status, location and throughput of inventory in an establishment. [Col. 1, lines 12-17.]

The best inventory control and management reporting information systems has [sic] the ability to determine and report the current location of any given article [ 12 ] in inventory. [Col. 5, lines 14-17.]

Every transaction is recorded, including identification of the articles placed in inventory. [Col. 5, lines 8-10.]

[I]ncoming articles to be placed in inventory are accumulated over a counter . . . . [Col. 6, lines 7-8.]

[A]rticles to be cleaned are associated with a unique bar code indicia for later automatic or semiautomatic optical scanning and data input, whereby the progress of articles through the laundry and drycleaning systems can be completely monitored. [Col. 2, lines 53-57.]

The prosecution history is also in accord. During prosecution of the original patent application in this case, Markman amended claim 1 in order to overcome an obviousness rejection by adding limitations reciting among other things "whereby said system can detect and localize spurious additions to inventory as well as spurious deletions therefrom." Markman argued in his remarks to the examiner that

unlike the usual system in which apparatus generates non-unique indicia (e.g., Stewart's price indicia) and/or indicia that is [sic] not produced concurrently with the commencement of a transaction (e.g., pre-printed tags), applicant's system is operable to keep a running reconcilable inventory total by adding input articles and subtracting output articles, *and also* protects against the possibility of undocumented or spuriously- documented articles entering the system.

Markman also referred the examiner to "features present" in claim 1, explaining:

Means are also provided for reconciling the very same unique and concurrently generated indicia at later points during processing whereby the entry or exit of inventory articles in irregular ways can be localized. Also, the prosecution history of the patent on reissue conflicts with Markman's argument now that claim 1 does not require "tracking" of articles of clothing. In

order to obtain other claims in the reissue patent broader than claim 1, which was carried through to the reissue patent, Markman explained the scope of the original claims thusly:

1. *Tracking of Individual Articles*

It may be argued that the claims are limited to a system that tracks individual articles such as individual pieces of clothing brought by a single consumer to a drycleaning establishment or the like. I believe that tracking of a transaction whether it involves one article or several is properly disclosed and allowable. The claim language recites entry of "descriptions of each of said articles associated with the transactions". This passage is more limited than I had a right to claim because, although individual articles, e.g. a pair of pants, could be accounted for by individual marking, scanning and reconciliation in reports, the grouping of such articles into sets for tracking (e.g., a suit comprising pants under jacket and/or a suit and a Dress or other separable [sic] articles grouped together) is reasonably disclosed as forming part of the invention and is allowable over the prior art.

It is evident from Markman's explanation of the claims to the examiner that he used "inventory" in the patent and the examiner understood "inventory" to consist of "articles of clothing." The prosecution history thus confirms the meaning of "inventory" as including "articles of clothing."

Markman argues that the extrinsic evidence of record provides substantial evidence in support of the jury's and his claim construction. Markman testified as an inventor of the patent in suit and as one of ordinary skill in the art (or, perhaps more accurately, one of "extraordinary" skill in the art) that "inventory" did not need to include articles of clothing. Markman's "patent expert" testified likewise, when giving his opinion on the proper construction of the claims. Finally, Markman argues that the testimony of Westview's president and some of its sales literature also support such claim construction. We do not find Markman's arguments persuasive.

First, the testimony of Markman and his patent attorney on the proper construction of the claims is entitled to no deference. For example, they both testified as to how the patent should be construed based on the text of the patent. This testimony about construction, however, amounts to no more than legal

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opinion -- it is precisely the process of construction that the court must undertake. Thus, as to these types of opinions, the court has complete discretion to adopt the expert legal opinion as its

own, to find guidance from it, or to ignore it entirely, or even to exclude it. See *Becton Dickinson & Co. v. C.R. Bard, Inc.*, 922 F.2d 792, 797, 17 USPQ2d 1097, 1100 (Fed. Cir. 1990). When legal "experts" offer their conflicting views of how the patent should be construed, or where the legal expert's view of how the patent should be construed conflicts with the patent document itself, such conflict does not create a question of fact nor can the expert opinion bind the court or relieve the court of its obligation to construe the claims according to the tenor of the patent. This opinion testimony also does not change or affect the *de novo* appellate review standard for ascertaining the meaning of the claim language. Thus, to the extent they were testifying about construction itself, we reject Markman's and Markman's patent expert's testimony as having any controlling effect on what the court below and we perceive to be the meaning of "inventory" as used in the patent and prosecution history.

Second, the extrinsic evidence of record cannot be relied on to change the meaning of the claims. In this case, as fully discussed above, the patent and prosecution history make clear that "inventory" in claim 1 includes in its meaning "articles of clothing." The district court exercised its discretion in finding unhelpful Markman's testimony that he meant "inventory," or that one of ordinary skill in the art would understand "inventory," to mean something to the contrary, and furthermore the district court rejected the testimony as conflicting with the meaning derived from the patent and prosecution history. In our construction of the claim term "inventory," we too find unhelpful and reject Markman's testimony. Similarly, even if they in fact used "inventory" to mean other than articles of clothing, Westview's sales literature and the testimony of its president do not dissuade us from our legal construction of the claim, based on the patent and prosecution history, that the claim term "inventory" means articles of clothing.

## V.

A. This decision that claim construction is properly viewed solely as a question of law is consistent with precedent of the Supreme Court and much of this court's precedent. Yet the dissenting and one of the concurring opinions assert that our decision violates the Seventh Amendment. A close analysis of the bases underlying their arguments reveals, however, that they are unsupported by logic and precedent.

The Seventh Amendment provides " [i]n suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved." U.S. Const. amend. VII. Thus, if an action could be tried to a jury in 1791, the right to a jury trial is preserved. The

Seventh Amendment has also been judicially interpreted as extending the right to jury trial to statutory causes of action analogous to common law actions. *Tull v. United States*, 481 U.S. 412, 417 (1987).

The dissenting and one of the concurring opinions express in somewhat different ways why they believe our holding deprives plaintiffs of the constitutional right to a jury trial in patent infringement cases. The dissenting opinion argues there are jury triable factual inquiries involved in determining the scope of a claim and this determination is part of and often dispositive of patent infringement questions. One concurring opinion, which apparently acknowledges that sometimes claim construction is a legal question for the court, nonetheless finds a majority effort to indirectly create a "complexity exception" to the right to jury trial in patent infringement cases that will allow a three judge panel of this court to "do pretty much what it wants under its de novo retrial."

These arguments do not ring true. In this opinion we do not deprive parties of their right to a jury trial in patent infringement cases. Our opinion merely holds that part of the infringement inquiry, construing and determining the scope of the claims in a patent, is strictly a legal question for the court. 13 The patentee's right to a jury trial on the application of the properly construed claim to the accused device is preserved as it was in 1791.

Any constitutional concerns raised by this opinion must be limited to the issue of claim construction. It is significant that neither the dissenting nor the concurring opinions cite any cases supporting the proposition that claim construction was a question of fact or

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involved triable issues of fact to a jury in or prior to 1791. None of the briefs of the parties or amici cite such a case, nor have we found any. The search for such a case may well be a fruitless one because of the manifest differences in patent law in eighteenth century England and patent law as it exists today in Title 35 of the United States Code. See *Hogg*, 47 U.S. (6 How.) at 479-83 (citing the significant differences between English law and United States law and cautioning against reliance on the former when applying the latter); Emerson Stringham, *Outline of Patent Law* Section 5000, at 266-67 (1937) ("The patent claim, *first developed in the United States*, is now largely relied upon as defining the scope of protections. . . .") (emphasis added). See generally, P.J. Federico, *Origin and Early History of Patents*, 11 J.

Pat. Off. Soc'y 292 (1929).

B. The dissenting and one of the concurring opinions attempt to make the case that construing claims is analogous to construing and interpreting contracts, deeds, and wills. Traditionally courts have treated the construction of these documents as being a legal question for the court, but have stated that under certain circumstances the interpretation of an agreement may raise jury triable questions. Thus, by analogy, the argument is made that although claim construction may indeed be a question of law for the court, it also involves (or, in the argument of the concurrence, may involve) triable issues of fact.

The analogy of a patent to a contract may appear to some extent to be an appropriate way of describing the circumstances surrounding the issuance of a patent. 14 The inventor is required to make full disclosure of his invention to the Patent and Trademark Office (PTO) and to the public in his patent specification, which he is otherwise not obligated to do. In return, the law allows the government to confer a property right to exclude anyone else from making, using, or selling the invention covered by the claims for seventeen years, which it is otherwise not obligated to do.

The analogy of a patent to a contract is not useful, however, in the context of a patent infringement suit. Patents are not contracts per se and patent infringement actions have never been viewed as breach of contract actions. Patent infringement has often been described as a tort. In a patent infringement suit, the inventor sues a competitor for infringing upon his right to exclude. The competitor is never a party to the so-called "contract" between the government and the inventor. See *Keystone*, 95 U.S. at 279 ("As patents are procured *ex parte*, the public is not bound by them, but the patentees are."). Nor does the competitor ever breach this contract between the government and the inventor by making, using, or selling the accused devices.

Questions of fact may arise in construing contracts, deeds, or wills in two contexts. First, the document may not reflect the agreement between, or the intent of, the two parties. Thus, unless the document is fully integrated and the parol evidence rule (or its equivalent in the other areas of law) applies, extrinsic evidence may be offered to demonstrate different or additional terms. There is no parol evidence rule in patent law for obvious reasons. It is axiomatic that the invention protected by the patent must be covered by the claims, otherwise it is lost. *Motion Picture Patents Co. v. Universal Film Mfg. Co.*, 243 U.S. 502, 510 (1917). Parol or other extrinsic evidence cannot add, subtract, or vary the limitations of the claims.

A question of fact may also arise in construing contracts, deeds, or wills when there is an

ambiguous term. In this situation, the parol evidence rule does not apply and extrinsic evidence may be offered to demonstrate what the parties intended when they used the term. Thus the factual inquiry for the jury in these cases focuses on the subjective intent of the parties when they entered into the agreement.

No inquiry as to the subjective intent of the applicant or PTO is appropriate or even possible in the context of a patent infringement suit. The subjective intent of the inventor when he used a particular term is of little or no probative weight in determining the scope of a claim (except as documented in the prosecution history). *See Senmed*, 888

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F.2d at 817, n.8, 12 USPQ2d at 1512 n.8. In fact, commonly the claims are drafted by the inventor's patent solicitor and they may even be drafted by the patent examiner in an examiner's amendment (subject to the approval of the inventor's solicitor). *See* Manual of Patent Examining Procedure (MPEP) Section 1302.04 (Rev. 15, Aug. 1993) ("Examiner's Amendments and Changes"). While presumably the inventor has approved any changes to the claim scope that have occurred via amendment during the prosecution process, it is not unusual for there to be a significant difference between what an inventor thinks his patented invention is and what the ultimate scope of the claims is after allowance by the PTO. *See generally Senmed*, 888 F.2d at 819 n.8, 12 USPQ2d at 1521 n.8. Of course the views of the other party to the "patent contract," the government, are generally not obtainable, except as reflected in the prosecution history. *See Western Elec. Co. v. Piezo Tech., Inc.*, 860 F.2d 428, 432-33, 8 USPQ2d 1853, 1856-57 (Fed. Cir. 1988); MPEP Section 1701.01 ("Office personnel not to testify").

Thus the focus in construing disputed terms in claim language is not the subjective intent of the parties to the patent contract when they used a particular term. Rather the focus is on the objective test of what one of ordinary skill in the art at the time of the invention would have understood the term to mean.

Moreover, ideally there should be no "ambiguity" in claim language to one of ordinary skill in the art that would require resort to evidence outside the specification and prosecution history. Section 112 of Title 35 requires that specifications "contain a written description of the invention, and of the manner and process of making and using it, in such *full, clear, concise, and exact* terms as to enable any person skilled in the art to which it pertains, or with which it

is most nearly connected, to make and use the same . . ." and requires that the specification "shall conclude with one or more claims *particularly pointing out and distinctly claiming* the subject matter which the applicant regards as his invention." 35 U.S.C. Section 112 (emphasis added). This statutory language has as its purpose the avoidance of the kind of ambiguity that allows introduction of extrinsic evidence in the contract law analogy. *See, e.g., Keystone*, 95 U.S. at 278 ("When the terms of a claim in a patent are clear and distinct ( *as they always should be* ), the patentee, in a suit brought upon the patent, is bound by it.") (emphasis added). Patent applications, unlike contracts, are reviewed by patent examiners, quasi-judicial officials trained in the law and presumed to "have some expertise in interpreting the [prior art] references and to be familiar from their work with the level of skill in the art and whose duty it is to issue only valid patents." *American Hoist & Derrick Co. v. Sowa & Sons, Inc.*, 725 F.2d 1350, 1359, 220 USPQ 763, 770 (Fed. Cir. 1984). *See also Western Electric*, 860 F.2d at 431, 8 USPQ2d at 1857. If the patent's claims are sufficiently unambiguous for the PTO, there should exist no factual ambiguity when those same claims are later construed by a court of law in an infringement action. *See Intervet Am.*, 882 F.2d at 1053, 12 USPQ2d at 1476 ("Ambiguity, undue breadth, vagueness, and triviality are matters that go to claim *validity* for failure to comply with 35 U.S.C. Section 112-Para. 2, not to interpretation or construction.") (emphasis in original).

This does not mean there is never a need for extrinsic evidence in a patent infringement suit. A judge is not usually a person conversant in the particular technical art involved and is not the hypothetical person skilled in the art to whom a patent is addressed. Extrinsic evidence, therefore, may be necessary to inform the court about the language in which the patent is written. But this evidence is not for the purpose of clarifying ambiguity in claim terminology. It is not ambiguity in the document that creates the need for extrinsic evidence but rather unfamiliarity of the court with the terminology of the art to which the patent is addressed.

Accordingly, the contract, deed, and will cases relied upon in the dissenting and concurring opinions serve only to highlight the differences between claim construction in a patent infringement case and contract interpretation in a breach of contract suit or construction/interpretation of a will in a will contest. They reflect the court's concern with finding the "true" intention of the parties to an agreement, deed, or will. 15 This sort of

inquiry is not appropriate, or even possible, in the context of patent litigation. Infringement litigation may involve multiple actions against different defendants none of whom has any personal knowledge of or participation in the PTO proceedings where the give and take that results in the negotiated claim language occurs. Thus there can be no search for the defendant party's intent.

C. The more appropriate analogy for interpreting patent claims is the statutory interpretation analogy. Statutory interpretation is a matter of law strictly for the court. There can be only one correct interpretation of a statute that applies to all persons. Statutes are written instruments that all persons are presumed to be aware of and are bound to follow. Statutes, like patents, are enforceable against the public, unlike private agreements between contracting parties. When interpreting statutes, a court looks to the language of the statute and construes it according to the traditional tools of statutory construction, including certain well known canons of construction. *United States v. John C. Grimberg Co.*, 702 F.2d 1362, 1365, 1368 (Fed. Cir. 1983). A court may also find it necessary to review the legislative history of the statute, which is itself a matter of public record, just as the specification and prosecution history of a patent are public records. *Id.* at 1369. While a court may seek from the public record to ascertain the collective intent of Congress when it interprets a statute, the subjective intent of any particular person involved in the legislative process is not determinative. Thus the members of Congress, or staffpersons who draft legislation, are not deposed or called on to testify in actions involving statutory interpretation. Similarly, the subjective meaning that a patentee may ascribe to claim language is also not determinative. Thus, it is from the public record that a court should seek in a patent infringement case to find the meaning of claim language.

There are, of course, differences between a statute and a patent. But because both of these public instruments may create liability in third persons who were not participants in the legislative process or the PTO proceedings, as the case may be, we conclude that the statutory interpretation model is a more accurate model than the contractual one for purposes of determining whether constitutional protections are transgressed by assigning claim construction exclusively to judges.

D. The dissenting opinion and one of the concurring opinions, along with Markman and certain of the amici, contend that assigning claim construction exclusively to judges is in conflict with certain decisions of the Supreme Court. We are not persuaded. The dissenting and concurring



opinions place heavy reliance on two Supreme Court cases, *Silsby v. Foote*, 55 U.S. (14 How.) 218 (1852), and *Bischoff v. Wethered*, 76 U.S. (9 Wall.) 812 (1869), for the proposition that questions of fact may arise in the determination of the scope of a patent claim. A close examination of these cases, however, reveals they do not support that argument. 16

In *Silsby v. Foote*, the Court affirmed a trial judge who left the question of what elements were "essential" for the claimed invention to the jury. According to the Court, the claim in that case stated: "I also claim the combination, above described, by which the regulation of the heat of the stove, or other structure in which it may be used, is effected." *Id.* at 226. The Court agreed with the petitioner that "[t]he construction of the claim was undoubtedly for the court." *Id.* at 225. The Court continued, however, that "[w]hen a claim does not point out and designate the particular elements which compose a combination, but only declares, as it properly may, that the combination is made up of so much of the described machinery as effects a particular result, it is a question of fact which of the described parts are essential to produce that result." *Id.* at 226. Thus the Court concluded that where a combination claim does not point out the elements of the claim but rather describes "machinery as effects a particular result," the jury may determine "which of the described parts are essential to produce that result." Otherwise, the question of claim scope belonged to the court.

It is difficult to see how *Silsby* supports the views set forth in the dissenting and

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concurring opinions. This is especially so because applicants are now required by 35 U.S.C. Section 112 to particularly point out and distinctly claim the subject matter the applicant regards as his invention and this requirement applies with equal force to claims having means-plus-function limitations. The only jury-triable issue described in *Silsby* on the question of claim scope is now statutorily foreclosed. Further, a jury is not allowed to canvass the patent specification to evaluate what portions of a combination claim are "essential" to produce a particular result. See *Keystone*, 95 U.S. at 278 ("This provision [the predecessor to section 112, para. 2] was inserted in the law for the purpose of relieving the courts from the duty of ascertaining the exact invention of the patentee by inference and conjecture, derived from a laborious examination of the previous inventions, and a comparison thereof with that claimed by him."). Both this court and the Supreme Court have made clear that all elements of a

patent claim are material, with no single part of a claim being more important or "essential" than another. See *Fay v. Cordesman*, 109 U.S. 408, 420-21 (1883); *Pennwalt Corp. v. Durand-Wayland Inc.*, 833 F.2d 931, 936, 4 USPQ2d 1737, 1741 (Fed. Cir. 1987) (in banc).

The reliance on *Bischoff v. Wethered* is even more puzzling. *Bischoff* did not even involve an infringement issue but rather involved a question of invalidity in a breach of contract action. The plaintiff, who sought to invalidate the patent on the basis of a prior art patent, argued that the court, and not the jury, should have decided the question of "identity or diversity of the inventions." *Bischoff*, 76 U.S. at 816. The Court disagreed. While the Court again acknowledged that "construction of written instruments is the province of the court alone," it concluded that in this case "[i]t is not the construction of the instrument, but the character of the thing invented, which is sought in questions of identity and diversity of inventions." *Id.* at 816.

Markman's case does not involve a question of identity or diversity of inventions. The word "claim" does not even appear in the *Bischoff* case. Rather *Bischoff* is concerned with divining the "character of the thing invented" from the patent in suit and the prior art patent. It is difficult, if not impossible, to discern any legal principle from *Bischoff* that relates to claim construction in the context of patent infringement. To the extent the dissenting and concurring opinions view claim construction in an infringement case as a search for the "character" of the thing invented, we disagree.

Finally, the concurring opinions consider that much of our opinion is dictum because there is no "genuine" dispute as to the claim term "inventory." As we have demonstrated, Markman squarely raised the issue of whether the court acted within its power in granting JMOL after the jury had construed the claims. The trial court viewed claim construction as a legal question and determined that it could decide the meaning of the term "inventory" as a matter of law based on the patent document and prosecution history. Markman, on the other hand, viewed the construction of the claim as one of fact with the jury verdict being supported by the evidence.

## CONCLUSION

Correctly reasoning that claim construction is a matter of law for the court, the district court properly rejected the jury's verdict and granted JMOL. Upon our *de novo* review of the court's construction of the claim language, we agree that "inventory" in claim 1 includes within its meaning "articles of clothing." It is undisputed that Westview's device does not and cannot

track articles of clothing. Accordingly, there is no substantial evidence to support the jury's finding of infringement of claims 1 and 10 of United States Reissue Patent No. 33,054 when those claims are correctly construed. The district court's grant of judgment of noninfringement as a matter of law is *AFFIRMED* .

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Footnotes

Footnote 1. A panel of this court heard oral argument in the appeal. On November 5, 1993, this court ordered *sua sponte* that the appeal be reheard in banc. The court also requested additional briefing and has been helped by the supplemental briefs of the parties and by the several briefs *amicus curiae* .

Footnote 2. "Directed verdict" has since been renamed "judgment as a matter of law" and is hereinafter referred to as such. *See* Fed. R. Civ. P. 50.

Footnote 3. The finding of noninfringement of independent claim 14 is not at issue in this appeal.

Footnote 4. Markman makes much of the distinction between tracking "individual" articles of clothing and tracking "batches" of clothing and says the district court erroneously restricted the invention to the former. For purposes of this appeal, this distinction is irrelevant because Westview's system tracks neither individual articles of clothing nor batches of clothing.

Footnote 5. The general rule is that in reviewing the law on a properly laid and renewed motion for JMOL, the appellate court is not bound by the instructions given the jury, even if they were not objected to. *Boyle v. United Technologies, Corp.* , 487 U.S. 500, 513-14 (1988)

(unobjected to jury instructions are not law of the case for purposes of JMOL); *City of St. Louis v. Praprotnik* , 485 U.S. 112, 120 (1988); 9 Charles A. Wright & Arthur R. Miller, *Federal Practice and Procedure* Section 2537, at 599-600 (1971). We therefore reject Markman's argument that we must defer to the jury's claim construction simply because the district court instructed the jury to interpret the claims and Westview did not object to this instruction. *See* Wright & Miller, *supra* , Section 2521.

Footnote 6. The dissenting opinion draws a distinction between claim interpretation and claim

construction based on the distinction made in contract law. We do not make the same distinction for, in our view, the terms mean one and the same thing in patent law. See *Senmed, Inc. v. Richard-Allan Medical Indus., Inc.*, 888 F.2d 815, 818, 12 USPQ2d 1508, 1511 (Fed. Cir. 1989); *Intervet Am., Inc. v. Kee-Vet Labs., Inc.*, 887 F.2d 1050, 1053, 12 USPQ2d 1474, 1476 (Fed. Cir. 1989). For consistency we use the term construction when referring to the first step in an infringement analysis.

Footnote 7. The views of the "special concurrence" in *Envirotech*, contending that the claims on appeal had been properly submitted to the jury and were not reviewed *de novo* on appeal, were not adopted by the majority opinion. 730 F.2d at 763, 221 USPQ at 481 (Baldwin, J., specially concurring). Accordingly, the concurrence's "spin" on the case is not the position of the court.

Footnote 8. *Palumbo* also presented the issue of construction of means-plus-function claim limitations under 35 U.S.C. Section 112, para. 6. As that issue is not before us today, we express no opinion on the issue of whether a determination of equivalents under Section 112, para. 6 is a question of law or fact.

Footnote 9. The Supreme Court has also in equity cases considered the scope of a patent to be a matter of law, not subject to deferential review. See *Seymour v. Osborne*, 78 U.S. (11 Wall.) 516, 546 (1871); *Bates v. Coe*, 98 U.S. 31, 38-39 (1879); *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222, 224 (1880); *Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126, 134, 52 USPQ 275, 279 (1942).

Footnote 10. Accord *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1120, 227 USPQ 577, 585 (Fed. Cir. 1985) (in banc) ("the district court's construction of the claims in light of the prosecution history [is] a question of law"); *Lemelson v. United States*, 752 F.2d 1538, 1550, 1552, 224 USPQ 526, 533 (Fed. Cir. 1985) ("The prosecution histories being admitted into evidence, the court should have considered them in its construction of the claims."); *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 1270, 229 USPQ 805, 811 (Fed. Cir. 1986) ("[T]he prosecution history can and should, where relevant, be assessed (along with, e.g., claim language and specification) in properly interpreting claim language."); *Mannesmann Demag Corp. v. Engineered Metal Prods. Co.*, 793 F.2d 1279, 1283, 230 USPQ 45, 47 (Fed. Cir. 1986) ("in view of the prosecution history the district court correctly interpreted the literal meaning of" the claim language at issue); 6 Ernest B. Lipscomb III, *Walker on Patents* Section 21:1, at 261 (3d ed. 1987) ("The words of a patent or patent application, like the words of

specific claims therein, always raise a question of law for the court. . .").

Footnote 11. For an example of very thorough appellate review of claim construction based on the patent in view of extrinsic evidence, see *Mitchell v. Tilghman*, 86 U.S. (19 Wall.) 287, 379-90 (1874).

Footnote 12. It is undisputed that "article" means "article of clothing."

Footnote 13. Our opinion also holds that we review district court determinations on questions of claim construction under a *de novo* standard of review, like other legal questions. In this regard, we emphasize that we are reiterating the long-recognized appellate review standard for issues of law in the trial proceeding, regardless of whether the case was tried to a judge or a jury. Contrary to the contentions of the dissenting opinion, this does not "effect [ ] a dramatic realignment of jury, judge, and the appellate process."

Footnote 14. A patent, however, is not a contract. Contracts are executory in nature -- they contain promises that must be performed. See E. Allan Farnsworth, *Contracts* Section 1.1, at 3-4 (2d ed. 1990). Once a patent is issued, any purported exchange of promises between the applicant and the Patent and Trademark Office (PTO) has been fully executed. A patent is a statutory grant of the right to exclude others from making, using, or selling the invention recited in the claims, read in light of the specification. 35 U.S.C. Section 154. There is no discretion on the part of the PTO as to whether or not to grant the patent -- if the statutory requirements are met, a patent is issued. 35 U.S.C. Section 151. Likewise, the other party to the transaction, the patentee, cannot "contract" with any one other than the federal government to receive a right to exclude others from making, using, or selling his invention. See *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 162 [ 9 USPQ2d 1847 ] (1989).

Footnote 15. Illustrative of the search for the intent of the parties or the makers are the following opinions cited in the dissenting and concurring opinions. *Goddard v. Foster*, 84 U.S. (17 Wall.) 123, 142-43 (1873) (in a contract between two parties, courts "are not denied the same light and information the parties enjoyed when the contract was executed, but they may acquaint themselves with the persons and circumstances that are the subjects of the statements in the written agreement"); *Brown & Co. v. M'Gran*, 39 U.S. (14 Pet.) 479, 493 (1840) ("[T]he true interpretation of the language may be left to the consideration of the jury for the purpose of carrying into effect the real intention of the parties."); *Startex Drilling Co. v. Sohio Petroleum Co.*, 680 F.2d 412, 415 (5th Cir. 1982) (submitting case to jury "to determine what the parties meant" by ambiguous terms in the contract); *In re Union Trust Co.*, 151 N.Y.S. 246, 249 (Sur.

Ct.) ("The first and cardinal rule of interpretation of wills is the application of the meaning of the testator, not the meaning of the adjudications."), *modified* , 156 N.Y.S. 32 (1915); *see also Reed v. Proprietors of Locks & Canals on Merrimac River* , 49 U.S. (8 How.) 274, 288 (1850) ("Whereas the intention of the parties is to be found in their deed alone, which it is the duty of the court to construe.").

Footnote 16. One concurring opinion also relies on *Winans v. Denmead* , 56 U.S. (15 How.) 330 (1853), as a case where the court "construed" the claim in a general manner and left it for the jury to fill in specifics. As correctly noted by the dissent, this case is more properly understood as one involving the doctrine of equivalents infringement notwithstanding the literal language of the claims.

### Concurring Opinion Text

#### Concur By:

Mayer, J., concurring in the judgment.

Today the court jettisons more than two hundred years of jurisprudence and eviscerates the role of the jury preserved by the Seventh Amendment of the Constitution of the United States; it marks a sea change in the course of patent law that is nothing short of bizarre. Sadly, this decision represents a secession from the mainstream of the law. It portends turbulence and cynicism in patent litigation. For this is not just about claim language, it is about ejecting juries from infringement cases. All these pages and all these words cannot camouflage what the court well knows: to decide what the claims mean is nearly always to decide the case. But today's action is of a piece with a broader bid afoot to essentially banish juries from patent cases altogether. If it succeeds juries will be relegated, in those few cases where they have any presence at all, to rubber stamps, their verdicts preordained by "legal" and

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"equitable" determinations that brook only one "reasonable" result. Indeed, this movement would vest authority over patent disputes in legislative courts, unconstrained by Article III and the Seventh Amendment. *See In re Lockwood* , Misc. Docket No. 394, slip op. at 6 (Fed.

Cir. filed Feb. 7, 1995) (opinion dissenting from order denying rehearing in banc) ("A constitutional jury right to determine validity of a patent does not attach to this public grant. Congress could place the issue of validity entirely in the hands of an Article I trial court with particular expertise if it chose to do so."). Declaiming that the jury is a "black box" incapable of a "reasoned decision", several judges of the court have already advised that they are aboard this campaign. *Id.*, slip op. at 20-21. The quest to free patent litigation from the "unpredictability" of jury verdicts, and generalist judges, results from insular dogmatism inspired by unwarrantable elitism; it is unconstitutional.

The question is whether the interpretation of patent claims is a purely legal exercise -- always decided by the judge as a matter of law and never raising a question of fact -- or rather a mixed question of law and fact, in which some factual matters might need to be resolved by the factfinder on the way to construing the claims as a matter of law. The answer is critical to how questions of claim interpretation are decided at the trial level and how we review them on appeal.

The ultimate issue of patent scope, depending as it does on the legal effect of the words of the claims, is a question of law. But it does not necessarily follow that the judge is to decide every question that arises during the course of claim construction as a matter of law. *Cf. Graham v. John Deere Co.*, 383 U.S. 1, 17 [ 148 USPQ 459 ] (1966) (obviousness is a legal conclusion with underlying factual determinations).<sup>1</sup> Instead, characterization of claim construction as "legal" begs the questions whether fact issues may arise subsidiary to the ultimate legal conclusion, how such issues are to be decided, and by whom.

Contrary to what it says today, this court (including the judges in the majority) has always held that claim interpretation is a matter of law depending on underlying factual inquiries. *See, e.g., Arachnid Inc. v. Medalist Mktg. Corp.*, 972 F.2d 1300, 1302, 23 USPQ2d 1946, 1948 (Fed. Cir. 1992) (though claim construction is issue of law for the court, it "may require the factfinder to resolve certain factual issues such as what occurred during the prosecution history"); *Lemelson v. General Mills Inc.*, 968 F.2d 1202, 1206, 23 USPQ2d 1284, 1288 (Fed. Cir. 1992) (same, noting that "underlying factual issues in dispute become the jury's province to resolve in the course of rendering its verdict on infringement"); *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1579, 12 USPQ2d 1382, 1386 (Fed. Cir. 1989) ("A disputed issue of fact may, of course, arise in connection with interpretation of a term in a claim if there is a genuine evidentiary conflict created by the underlying probative evidence pertinent to the claim's interpretation. However,

without such evidentiary conflict, claim interpretation may be resolved as an issue of law by the court. . . ." (citation omitted)); *see also Tol-O-Matic Inc. v. Proma Produkt-Und Mktg.* , 945 F.2d 1546, 1552, 20 USPQ2d 1332, 1338 (Fed. Cir. 1991) (substantial evidence supported jury's presumed fact findings on disputed terms and prosecution history); *SmithKline Diagnostics Inc. v. Helena Lab. Corp.* , 859 F.2d 878, 885, 8 USPQ2d 1468, 1474 (Fed. Cir. 1988) (fact findings on disputed prosecution history clearly erroneous); *Perini America v. PCM Co.* , 832 F.2d 581, 586, 4 USPQ2d 1621, 1625 (Fed. Cir. 1987) (in bench trial, court's interpretation of disputed claim terms not clearly erroneous); *Tillotson Ltd. v. Walbro Corp.* , 831 F.2d 1033, 1039, 4 USPQ2d 1450, 1454 (Fed. Cir. 1987) (vacating summary judgment where construction turns on factual disputes arising from specification, prosecution history, and industry practice); *Tandon Corp. v. ITC* , 831 F.2d 1017, 1021, 4 USPQ2d 1283, 1286 (Fed. Cir. 1987) (Commission's findings on prosecution history and meaning of terms supported by substantial evidence); *H.H. Robertson Co. v. United Steel Deck Inc.* , 820 F.2d 384, 389, 2 USPQ2d 1926, 1929 (Fed. Cir. 1987) (in bench trial, court's fact findings on claim terms not clearly erroneous); *Howes v. Medical Components Inc.* , 814 F.2d 638, 646, 2 USPQ2d 1271, 1275 (Fed. Cir. 1987) (vacating summary judgment because of fact issues surrounding prosecution

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history); *Moeller v. Ionetics, Inc.* , 794 F.2d 653, 657, 229 USPQ 992, 995 (Fed. Cir. 1986) (vacating summary judgment where terms create underlying fact dispute); *Palumbo v. Don-Joy Co.* , 762 F.2d 969, 976, 226 USPQ 5, 9 (Fed. Cir. 1985) (vacating summary judgment where fact question of equivalents of "means plus function" claim disputed); *Bio-Rad Lab., Inc. v. Nicolet Instrument Corp.* , 739 F.2d 604, 614, 222 USPQ 654, 662 (Fed. Cir. 1984) (substantial evidence supported jury interpretation of disputed terms); *McGill Inc. v. John Zink Co.* , 736 F.2d 666, 675, 221 USPQ 944, 951 (Fed. Cir. 1984) (reversing jury verdict where construction premised on facts not supported by substantial evidence). So it is remarkable that the court so casually changes its collective mind, especially when the just cited precedent was compelled by the Seventh Amendment and not the mere preference of a sufficient number of judges. 2 The court's revisionist reading of precedent to loose claim interpretation from its factual foundations will have profoundly negative consequences for the well-established roles of trial judges, juries,



and our court in patent cases.

## I.

Anyone who wants to know what a patent protects must first read its claims, for they are the measure of its scope. *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 339 (1961). Claim language does not exist in a vacuum; it must be understood by reference to the documents annexed to the patent grant, including the specification, of which the claims are a part, and any drawings. *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 397, 155 USPQ 697, 702 (Ct. Cl. 1967). The prosecution history often proves useful in determining a patent's scope, for it reveals the course of dealing with the Patent Office, which may show a particular meaning attached to the terms, or a position taken by the applicant to ensure that the patent would issue. *Graham v. John Deere Co.*, 383 U.S. at 33. These documents are always available during the course of claim interpretation; they are not extrinsic evidence, though some opinions so characterize them, because they are essentially incorporated into the patent itself.

Patents are directed to those skilled in the art. The task of determining just what the claims mean to skilled artisans falls, in the first instance, to the court. But if, after consideration of all of this documentation, the judge cannot readily resolve the

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meaning of the claims, he resorts to extrinsic evidence to shed light on them. *Moeller*, 794 F.2d at 657, 229 USPQ at 995 (trial judge's failure to allow expert testimony was abuse of discretion). This evidence, in the form of prior art documentary evidence or expert testimony, can show what the claims would mean to those skilled in the art. The content of the prior art and the testimony of technical experts can reveal how others use and understand technical terms that may appear ambiguous or opaque to the judge, who rarely has the knowledge of those skilled in the field of the patent. The inventor himself may qualify as an expert and testify what his claims would mean in the relevant art. 3 The judge can even advert to the testimony of patent law experts -- that is, patent lawyers -- for advice on the interpretation of claims. 4 If this information clarifies the meaning of the claims and is uncontested, the judge may rule as a matter of law.

But sometimes extrinsic evidence results in a genuine dispute over the meaning of a term or an

event during prosecution. 5 When that happens, it falls to the finder of fact to settle it. *Lemelson* , 968 F.2d at 1206, 23 USPQ2d at 1288; *Tol-O-Matic Inc. v. Proma Produkt-Und Mktg.* , 945 F.2d at 1550, 20 USPQ2d at 1336; *SmithKline Diagnostics Inc. v. Helena Lab. Corp.* , 859 F.2d at 882, 8 USPQ2d at 1472; *Palumbo v. Don-Joy Co.* , 762 F.2d at 974, 226 USPQ at 8.

When a question of claim construction arrives here on appeal, this court reviews the ultimate construction given the claims under the de novo standard applicable to all legal conclusions. But any facts found in the course of interpreting the claims must be subject to the same standard by which we review any other factual determinations: for clear error in facts found by a court; for substantial evidence to support a jury's verdict. Fed. R. Civ. P. 52(a); *Perini America v. PCM Co.* , 832 F.2d at 584, 4 USPQ2d at 1624; *McGill Inc. v. John Zink Co.* , 736 F.2d at 672, 221 USPQ at 948.

This standard recognizes the jury's important role in making factual determinations, and the role of the trial court as the primary decisionmaker in bench trials. A trial is "the 'main event' . . . rather than a 'tryout on the road.'" *Anderson v. City of Bessemer City* , 470 U.S. 564, 575 (1985). By broadly proclaiming all aspects of claim interpretation to be legal, the court today usurps a major part of the functions of both trial judge and jury in patent cases, obliterating the traditional, defined differences between the roles of judge and jury, and trial and appellate courts.

## II.

Beyond any policy argument supporting the traditional roles of judge and jury in patent cases, the court's decision today flies in the face of the constitutional right to a jury promised by the Seventh Amendment of the Constitution. That promise, "[i]n suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved," protects litigants' right to a jury trial where legal, as opposed to equitable, causes are to be determined. *Chauffers, Teamsters & Helpers Local No. 391 v. Terry* , 494 U.S. 558, 564 (1990). The amendment does not create an independent right to trial by jury but gives parties rights equivalent in scope to those that existed at common law, in England in 1791, when the Bill of Rights was ratified. *Tull v. United States* , 481 U.S. 412, 417 (1987). It does not stop there, however; it extends as well to statutory actions subsequently created by Congress if they are analogous to actions decided in the law courts of eighteenth century England. *Id.*

The Seventh Amendment does not guarantee the right to have a jury decide all issues in a case. It properly resolves only factual questions, while legal matters are for the court. Even within the realm of factual questions, whether a particular question must always go to the jury depends "on whether the jury must shoulder this responsibility as necessary to preserve the 'substance of the common-law right of trial by jury.'" *Id.* at 426 (quoting *Colgrove v. Battin*, 413 U.S. 149, 152 (1973)). The Seventh Amendment was intended not to formalize any particular rigid procedural rules, but "to preserve the basic institution of trial by jury in only its most fundamental elements. . . ." *Parklane Hosiery Co. v. Shore*, 439 U.S. 322, 337 (1979) (quoting *Galloway v. United States*, 319 U.S. 372, 392 (1943)); *see also* *Baltimore & Carolina Line, Inc. v. Redman*, 295 U.S. 654, 657 (1935) ("particularly to retain the common-law distinction between the province of the court and that of the jury"). But where a particular issue goes to these "fundamental elements" or the "substance of the common-law right of trial by jury," no court may constitutionally remove it from the jury. *See* *Walker v. New Mexico & So. Pac. R. Co.*, 165 U.S. 593, 596 (1897) (Seventh Amendment "requires that questions of fact in common law actions shall be settled by a jury, and that the court shall not assume directly or indirectly to take from the jury or to itself such prerogative."); *see also* *Granfinanciera S.A. v. Nordberg*, 492 U.S. 33, 51 (1989) (even Congress "lacks the power to strip parties contesting matters of private right of their constitutional right to a trial by jury."). The court's action in this case does just that.

An action for patent infringement is one that would have been heard in the law courts

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of old England. *See, e.g.*, *Bramah v. Hardcastle*, 1 Carp. P.C. 168 (K.B. 1789), *reprinted in* *I Decisions on the Law of Patents for Inventions* 51, 53 (Benjamin V. Abbott ed.) (1887) [hereinafter Abbott] (jury trial of infringement action; jury instructed that patent was invalid, but jury verdict for plaintiff not disturbed); *Morris v. Bramsom*, 1 Carp. P.C. 30 (K.B. 1776), *reprinted in* Abbott, *supra*, at 21 (jury trial of infringement action); *see also* *Boulton v. Bull*, 1 Carp P.C. 117 (C.P. 1795), *reprinted in* Abbott, *supra*, at 59, 74 ("[I]nfractionment or not, is a question for the jury; in order to decide this case, they must understand the nature of the improvement or thing infringed. . ."). In this country, a jury trial has always been available in patent cases where damages are sought. Indeed, the first Patent Act, in 1790, expressly

provided that a patent owner was entitled to "such damages as shall be assessed by a jury." Act of April 10, 1790, ch. 7, Section 4, 1 Stat. 109. In such cases, the jury has been entrusted with ruling on the ultimate question of infringement, as well as any factual disputes that arise subsidiary to the determination of the legal question of patent validity.

Not infrequently, the ultimate question of infringement, indisputably a matter for the jury, is effectively dictated by the construction given the patent claims. This happens, of course, when the judge affirmatively takes the question from the jury by granting summary judgment or judgment as a matter of law, as it did here; it can also occur when, even though the judge sends the question to the jury, his interpretation of the claims forces the jury's decision on infringement. That is to say, choosing between contending interpretations of a claim can decide the matter of infringement for all intents and purposes. Our constitutional mandate to preserve the right to jury trial therefore demands that we view any intrusion on the jury's role in deciding infringement with deep suspicion. See *Dimick v. Schiedt*, 293 U.S. 474, 486 (1935) ("Maintenance of the jury as a fact-finding body is of such importance and occupies so firm a place in our history and jurisprudence that any seeming curtailment of the right to a jury trial should be scrutinized with utmost care.").

Today's decision also threatens to do indirectly what we have declined to do directly, that is, create a "complexity exception" to the Seventh Amendment for patent cases. See *SRI Int'l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1130, 227 USPQ 577, 592 (Fed. Cir. 1985) (Markey, C.J., additional views). But there is simply no reason to believe that judges are any more qualified than juries to resolve the complex technical issues often present in patent cases. *Id.* at 1128 & n.7, 227 USPQ at 591 & n.7. Indeed, the effect of this case is to make of the judicial process a charade, for notwithstanding any trial level activity, this court will do pretty much what it wants under its de novo retrial. We have consistently stressed that the same rules apply to patent cases as apply to all other civil disputes. *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1547, 220 USPQ 193, 197 (1983) ("So long as the Seventh Amendment stands, the right to a jury trial should not be rationed, nor should particular issues in particular types of cases be treated differently from similar issues in other types of cases."). The court subverts this principle and the demands of the Seventh Amendment by the ruse of reclassifying factual questions as legal ones.

### III.

Those who argue for interpretation of claims solely as a matter of law by the judge spew a panoply of cases ostensibly in support. Close examination of these cases, however, reveals that, like the one before us today, interpretation of the claims at issue before the deciding court presented no real factual question. Thus, for example, in *Hogg v. Emerson*, 47 U.S. (6 How.) 437, 484 (1848), the Court stated that "without the aid of experts and machinists, [we have] no difficulty in ascertaining, from the language used here," the meaning of the patent. Similarly, *Winans v. New York & Erie R.R. Co.*, 62 U.S. (21 How.) 88, 100 (1858), allowed the possibility that "experts may be examined to explain terms of art, and the state of the art at any given time. They may explain to the court and jury the machines, models, or drawings exhibited." But the Court went on to say that there was only one construction of the patent "which the language of this specification will admit" and "it would be wholly superfluous to examine experts to teach the court, what they could clearly perceive without such information." *Id.* at 101. *Brown v. Piper*, 91 U.S. 37, 41 (1847), recognized that evidence on "what was old and in general use at the time of the alleged invention" was admitted at the trial but that it was unnecessary. "[W]e think the patent was void on its face, and that the court might have stopped short at that instrument, and without looking beyond it into the answers and testimony, *sua sponte*, if objection were not taken by counsel, well have adjudged in favor of the defendant." *Id.* at 44. See also *U.S. Indus. Chem., Inc. v. Carbide & Carbon Chem.*

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*Corp.*, 315 U.S. 668, 677 (1941) ("[O]n the face of the papers, the process described in the original patent included a step [omitted from the reissue]," and the trial court erroneously relied on unnecessary expert opinion in its improper conclusion that the reissue was not invalid.); *Exhibit Supply Co. v. Ace Corp.*, 315 U.S. 126, 134 (1941) ("examination of the drawings and specifications indicates clearly enough" the meaning of the claim); *Smith v. Snow*, 294 U.S. 1, 14 (1934) ("Examination of the claim, in light of both [undisputed] scientific fact and of the particular form in which the petitioner reduced the claim to practice as described in the specifications, makes it plain" what are the claim's relevant limitations.).

These cases simply do not address the effect of extrinsic evidence giving rise to a legitimate fact question. They are cases where the documentary record alone was wholly adequate to derive the patent's proper construction. 6 It is hardly surprising that courts would treat claim interpretation

under these circumstances as a matter of law, for it could not be otherwise. See Fed. R. Civ. P. 50(a) (court may grant judgment as a matter of law where underlying facts could not support reasonable jury verdict to the contrary), and 56(c) (summary judgment appropriate where there is no genuine issue as to any material fact); *Newell Companies, Inc. v. Kenney Mfg. Co.*, 864 F.2d 757, 762, 763, 9 USPQ2d 1417, 1421-22 (1988) (approving use of judgment as a matter of law and summary judgment on obviousness where underlying facts are not disputed).

Indeed, some cases cited in support of a purported rule that claim construction is always entirely a matter of law expressly limit the rule to those cases where the patent may be understood on the basis of the documents alone, without resort to extrinsic evidence; these cases acknowledge that fact questions could be raised that would require submission to a jury. In *Heald v. Rice*, 104 U.S. 737, 749 (1881), the Supreme Court explained:

That is, if it appears from the face of the instruments that extrinsic evidence is not needed to explain terms of art, or to apply the descriptions to the subject-matter, so that the court is able from mere comparison to say what is the invention described in each, and to affirm from mere comparison that the inventions are not the same, but different, then the question of identity is one of pure construction, and not of evidence, and consequently is a matter of law for the court, without any auxiliary matter of fact to be passed upon by a jury, if the action be at law.

The Court there determined that it had a case in which the question could be determined "from the mere reading of the two specifications" and that it was "too plain for argument that they are perfectly distinct." *Id.* at 753; see also *Singer Mfg. Co. v. Cramer*, 192 U.S. 265, 275 (1903) ("As in each of the patents in question it is apparent from the face of the instrument that extrinsic evidence is not needed . . . the question of infringement or no infringement is one of law. . . ."); *Market St. Cable Ry. Co. v. Rowley*, 155 U.S. 621, 625 (1894) (same as *Heald v. Rice*). These cases recognize that where extrinsic evidence is required and raises a real factual dispute, the question is no longer one of "pure construction," so that the jury must play its role in the construction of the claims.

But where the question has arisen -- where the proper construction of claims depends on the resolution of a factual dispute -- the Supreme Court has stated in no uncertain terms that the jury has the duty to decide. These are cases where the meaning of a patent may not be derived from its terms alone, forcing the judge to go beyond the documentary evidence for aid. This gives rise to issues of historical fact the resolution of which must be left to a jury.

The claim before the court in *Silsby v. Foote*, 55 U.S. (14 How.) 218 (1852), was directed to

"the combination, above described, by which the regulation of the heat of the stove, or other structure in which it may be used, is effected." *Id.* at 226. The specification disclosed a stove containing a number of discrete parts. To be sure, the judge "construed the claim"; he instructed the jury that it covered "a combination of such of the described parts as were combined and arranged for the purpose of producing a

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particular effect, viz., to regulate the heat of a stove." *Id.* at 225. But the defendants asked the judge to rule as a matter of law that the parts referred to in the claim were "the index, the detaching process, and the pendulum." *Id.* at 226. The trial court refused, holding that this question was for the jury.

The Supreme Court affirmed asking, "How could the Judge know this as a matter of law?" *Id.* Once the trial court had construed the claim and instructed the jury, "it therefore became a question for the jury, upon the evidence of experts, or an inspection by them of the machines, or upon both, what parts described did in point of fact enter into, and constitute an essential part of this combination." *Id.* Only then could the jury determine if the accused device contained all of these elements and was therefore an infringement. The Court said the "defendants' counsel exhibited to the court the models of the machines of the defendants and the plaintiff, for the purpose of satisfying the court the jury must have understood *they were at liberty to construe the claim* , and that *they did in truth so construe it* , as to exclude from the combination claimed by the plaintiff, what is called the detaching process." *Id.* (emphasis added).

Again in *Winans v. Denmead* , 56 U.S. (15 How.) 330 (1853), the court "construed" the claim in a general manner and left it for the jury to fill in the specifics. The claim at issue was directed to a rail car for the transportation of coal "in the form of a frustum of a cone, substantially as herein described, whereby the force exerted by the weight of the load presses equally in all directions." *Id.* at 342. The defendant requested the jury be instructed that the claim was limited to a circular form only, as was described in the specification and did not cover the defendant's rectilinear design. The Supreme Court affirmed the trial court's refusal of the instructions, stating that "where the whole substance of the invention may be copied in a different form, it is the duty of the courts and juries to look through the form for the substance of the invention -- for that which entitled the inventor to his patent, and which the patent was

designed to secure." *Id.* at 343.

The Court considered how far an alleged infringing car could depart from the form of a perfect circle and still infringe, and determined that the claim encompassed anything "so near to a true circle as substantially to embody the patentee's mode of operation, and thereby attain the same result as was reached by his invention." *Id.* at 344. It cited evidence, including expert testimony as to the mode of operation of the patentee's car and whether the accused car attained the same results as the claimed car. The Court unmistakably left it to the jury to determine the meaning of the claim, its scope, and refused to proclaim it a matter of law outside the province of the jury. *Id.*

These cases are especially relevant because they show that the jury has always had a role in determining a patent's scope. This historic reliance on juries to aid the court in deciding exactly what patents protect matters here because the Seventh Amendment demands that courts preserve the right to jury trial as it existed at common law. Old cases are obviously instructive under this peculiar standard. Accordingly, efforts to distinguish *Silsby* and *Winans* because of their age are disingenuous. This court has no office to invoke desuetude to evade the Seventh Amendment and the Supreme Court.

Our patent laws have always required inventors to point out their inventions in detail sufficient to both distinguish the prior art and tell the public what protection the patent confers. The very first patent act required that letters patent "describ [e] the said invention or discovery, clearly, truly, and fully." Act of Apr. 10, 1790, ch. 7, Section 1, 1 Stat. 109. The applicant for a patent was at the time required to submit "a specification in writing, containing a description . . . of the thing or things by him or them invented or discovered, . . . which specification shall be so particular . . . as . . . to distinguish the invention or discovery from other things before known and used." *Id.* Section 2. The word "claim" first appeared in the Act of 1836, ch. 357, Section 6, 5 Stat. 117 (July 4, 1836), requiring that the applicant "shall particularly specify and point out the part, improvement, or combination, which he claims as his own invention." Claims, per se, were not expressly required until the Act of 1870, ch. 230, Section 26, 16 Stat. 198 (July 8, 1870), which said the applicant "shall particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery", but they were in common use much earlier in rudimentary form. *See, e.g., Evans v. Eaton*, 20 U.S. 161, 194, 7 Wheat. 356, 428 (1822) (Specification concluded: "I claim as my invention, the peculiar properties or principles which this machine possesses, in spreading, turning and gathering the



meal, at one operation, and the rising and lowering its arms, by its motion, to accommodate itself to any quantity of meal it has to operate on.").

In light of this history, it is apparent that the 1870 Act simply codified the preference for particular claiming already expressed by

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the Supreme Court. See *Brooks v. Fiske*, 56 U.S. (15 How.) 212, 215 (1853) (specification and drawings to be considered "only for the purpose of enabling us to correctly interpret the claim"). This change from a regime of "central" claiming to one of "peripheral" claiming may seem a major step in the patent discipline, but the distinction it represents is irrelevant to the Seventh Amendment. When the trial court in *Silsby* construed the claim there at issue, it was performing essentially the same task of claim construction as courts perform today. When the judge then left it for the jury to clarify the ambiguity as to just what elements the claims encompassed, he recognized the existence of a jury question precisely the same as that which the court rejects today.

Even if it were correct that the 1870 Act created a new and different claiming requirement out of whole cloth, I see no evidence that Congress thereby intended to strip the jury of its traditional role in determining patent scope. Indeed, the Seventh Amendment's command that we preserve jury trial rights as they existed at common law dictates that Congress could not have taken the question from the jury even if it wanted to. See *Granfinanciera*, 492 U.S. at 51 (Congress "lacks the power to strip parties contesting matters of private right of their constitutional right to a trial by jury"; private rights involve "the liability of one individual to another under the law as defined" (quoting *Crowell v. Benson*, 285 U.S. 22, 50 (1932))).

Cases involving patent interpretation in the validity context reach the same result. 7 For example, in *Bischoff v. Wethered*, 76 U.S. (9 Wall.) 812 (1869), the Court explained that although it was normally the "province of the court, and not the jury, to construe the meaning of documentary evidence," the "specifications of patents for inventions are documents of a peculiar kind." *Id.* at 815. The Court stated further that inventions, the subjects of patents, "have their existence *in pais*, outside of the documents themselves; and which are commonly described by terms of art or mystery to which they respectively belong; and these descriptions and terms of art often require peculiar knowledge and education to understand them aright." *Id.*

Accordingly, an understanding of the patented invention "is to be properly sought, like the explanation of all latent ambiguities arising from the description of external things, by evidence *in pais* , " outside of the patent document. *Id.* This inquiry "belong [s] to the province of evidence, and not that of construction," and thus falls to the jury. *Id.* at 816.

This illustrates how claim construction may sometimes require the resolution of factual matters before a claim can be authoritatively construed. The exercise is further informed by decisions interpreting analogous instruments, for patents are legal documents like contracts or deeds. *See Goodyear Dental Vulcanite Co. v. Davis* , 102 U.S. 222, 227 (1880) (patent as contract); *Motion Picture Patents Co. v. Universal Film Mfg. Co.* , 243 U.S. 502, 510 (1917) (patent as deed). The analogies are most apt. A patent can be conceived of as a contract between the inventor and the government. In return for full disclosure of the invention the government gives a monopoly of sorts for a time. The rest of us may be third party beneficiaries of this deal, partaking of the advancement of knowledge the patent represents. Or a patent may be thought of as a form of deed which sets out the metes and bounds of the property the inventor owns for the term and puts the world on notice to avoid trespass or to enable one to purchase all or part of the property right it represents. The public holds a vested future interest in the property.

Accordingly, patents should be interpreted under the same rules as govern interpretation of kindred documents. *Merrill v. Yeomans* , 94 U.S. 568, 571 (1877). The interpretation of a contract or a deed, like a patent, is ultimately a question of law. There is nothing novel about the principle that, in the words of Justice Story, "the interpretation of written documents properly belongs to the Court, and not to the jury." *Brown & Co. v. McGran* , 39 U.S. (14 Pet.) 479, 493 (1840). This principle has been routinely evoked in the context of contract law. *See Levy v. Gadsby* , 7 U.S. 109, 112, 3 Cranch 180, 186 (1805) ("the construction of a written evidence is exclusively with the court"); *Goddard v. Foster* , 84 U.S. (17 Wall.) 123, 142 (1872) (" [I]t is well-settled law that written instruments are always to be construed by the court. . . ."); *see also Meredith v. Picket* , 22 U.S. 253, 254, 9 Wheat. 573, 575 (1824) (interpreting a deed, " [t]he Judges must construe the words of an entry, or any other title paper, according to their own opinion of the words as they are found in the instrument itself").

In light of such emphatic Supreme Court language, one might conclude that the meaning of a contract is first and last a question of law which in no instance should be resolved by a factfinder. But as Justice Story also was careful to point out in *McGran*, "there certainly are cases, in which, from the different senses of the words used, or their obscure and indeterminate reference to unexplained circumstances, the true interpretation of the language may be left to the consideration of the jury for the purpose of carrying into effect the real intention of the parties." 39 U.S. (14 Pet.) at 493.

Story used the facts of *McGran* to illustrate the point. One issue was the meaning of certain words used by the parties in letters which formed an agreement on the sale of cotton. The language was susceptible of more than one interpretation and its meaning would depend on the surrounding circumstances. Therefore, the trial judge properly refused to tell the jury what the letters meant, because to do so would have removed from the jury "matters of fact in controversy before the jury upon which it was exclusively their province to decide." *Id.* *Goddard v. Foster* similarly held that written instruments are for the court "except when they contain technical words, or terms of art, or when the instrument is introduced in evidence collaterally, and where its effect depends not merely on the construction and meaning of the instrument, but upon extrinsic facts and circumstances, in which case the inference to be drawn from it must be left to the jury." 84 U.S. (17 Wall.) at 142. *See also Reed v. Proprietors of Locks & Canals on Merrimac River*, 49 U.S. (8 How.) 274, 289 (1850) (allowing jury to interpret vague or ambiguous deed, where "it necessarily becomes a fact for the jury to decide, whether the land in controversy is included therein").

The principle that documentary interpretation is a matter of law has become a basic tenet of modern contract law. Equally established, however, is the caveat that extrinsic evidence, such as custom and usage of the trade and course of dealing between the parties, akin to prior art, level of skill in the art, and events in the Patent Office, may be introduced to inform the meaning of terms in the contract. And when such evidence is brought in and creates a real conflict, it results in a question of fact for the jury. *Great N. Ry. Co. v. Merchants Elevator Co.*, 259 U.S. 285, 292 (1922); *cf. Reed*, 49 U.S. (8 How.) at 290 (meaning of deed). This is true even though in some circumstances the factual exercise of assigning meaning to a term of a contract serves to decide the meaning of the contract. Until today, the same rule has applied in the interpretation of patents. 8

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Footnotes

Footnote 1. While the ultimate question of patent validity is one of law, *Graham v. John Deere Co.*, 383 U.S. 1, 17 [ 148 USPQ 459 ] (1966), there are a number of underlying inquiries that raise questions of fact. In addition to obviousness, these include anticipation, *Atlas Powder Co. v. E.I. DuPont de Nemours & Co.*, 750 F.2d 1569, 1573, 224 USPQ 409, 411 (Fed. Cir. 1985), prior public use or sale, *U.S. Envtl. Prods., Inc. v. Westall*, 911 F.2d 713, 715, 15 USPQ2d 1898, 1900 (Fed. Cir. 1990) (a legal conclusion supported by underlying facts), and sufficiency of a specification's disclosure, *Utter v. Hiraga*, 845 F.2d 993, 998, 6 USPQ2d 1709, 1714 (Fed. Cir. 1988) (same).

Footnote 2. The court pretends there is a line of contrary authority. *Ante* at 12, 14. But most of its cases arrived at this court after bench trials -- a puzzling source for guidance on the commands of the Seventh Amendment; others actually implicating the right to a jury trial sprang from facts simply inadequate to support a reasonable jury verdict. Indeed, the one case that pays lip service to this novel rule, *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 822-23, 23 USPQ2d 1426, 1432-33 (Fed. Cir. 1992), like this case, did not require excursion beyond the patent documents themselves. There may be a reason why the court is hellbent for its result, but it does not emanate from the cases.

Footnote 3. Of course, the inventor's testimony as to what he intended or how he understands the patent, as opposed to his testimony as an expert, may be relevant, but is entitled to little weight in the face of evidence to the contrary. See *North American Vaccine v. American Cyanamid Co.*, 7 F.3d 1571, 1577, 28 USPQ2d 1333, 1337 (Fed. Cir. 1993) (inventor's "after-the-fact testimony is of little weight compared to the clear import of the patent disclosure itself"); *Intellical, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992) ("where a disputed term would be understood to have its ordinary meaning by one of skill in the art from the patent and its history, extrinsic evidence that the inventor may have subjectively intended a different meaning does not preclude summary judgment.").

Footnote 4. A fact dispute cannot arise solely from testimony of a patent law expert. While this sort of testimony is acceptable, even if often overdone, as an interpretive aid to the court, it is

not evidence and cannot create a genuine fact question for the jury. See *Nutrition 21 v. United States*, 930 F.2d 862, 871 n.2, 18 USPQ2d 1347, 1350 n.2 (Fed. Cir. 1991) (patent law expert's "opinion on the ultimate legal conclusion is neither required nor indeed 'evidence' at all"); see also *Avia Group Int'l, Inc. v. L.A. Gear Cal., Inc.*, 853 F.2d 1557, 1564, 7 USPQ2d 1548, 1554 (Fed. Cir. 1988) (conflicting opinions of legal experts create no material issue of fact).

Footnote 5. Of course, not every disagreement gives rise to a genuine fact question. *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1580, 12 USPQ2d 1382, 1386 (Fed. Cir. 1989); see also *Senmed Inc. v. Richard-Allen Medical Indus.*, 888 F.2d 815, 819 n.8, 12 USPQ2d 1508, 1512 n.8 (1989) (inventor's testimony as to meaning of "on" contrary to ordinary meaning raised no real "dispute").

Footnote 6. In one case where it appeared the Court "avail [ed] itself of the light furnished by the evidence to enable it to understand the terms used in the patent and the devices and operations described or alluded to therein," *Webster Loom Co. v. Higgins*, 105 U.S. 580, 586 (1881), the evidence was examined in ruling on the issue of enablement, i.e., whether those of skill in the art would understand the terms of the patent. Even given the conflicting testimony, the Court concluded that the terms of the patent were "sufficiently clear and full in the description of the invention." *Id.* at 589. When it reached the question of infringement, however, it did not mention any evidence other than the specification and claims and stated "if we examine the language of the claim [in light of the specification], it seems to us that all doubt as to its meaning is removed." *Id.* at 598. There was no reliance on any extrinsic evidence in construing the claims for purposes of infringement.

Footnote 7. Cases about patent validity are authoritative on the issue of claim construction. A claim must be interpreted the same for both validity and infringement. *E.g.*, *SmithKline Diagnostics Inc. v. Helena Lab. Corp.*, 859 F.2d 878, 882, 8 USPQ2d 1468, 1471 (Fed. Cir. 1988). A claim must be construed before determining its validity just as it is first construed before deciding infringement.

Footnote 8. After emphasizing that patents are construed according to the same rules that apply to other legal instruments, the court decides that a patent is like a contract or a deed in the context of disputes over its creation or its validity, but that when it comes to the question of infringement, a patent is like a statute. Wholly aside from the metaphysical implications of this curious duality to the traditional rule that patents are interpreted for validity just as they are for

infringement, it is simply a bogus analogy. Patents cannot be baby statutes because they are prepared *ex parte* by interested parties, drafted in the lower reaches of an executive department, and issued ministerially by a political officer. They have none of the indicia of a real statute, but the court imbues them with a transconstitutional power to compromise the role of juries in the third branch of government. Not even a congressionally passed, presidentially signed law can match that. See *Granfinanciera S.A. v. Nordberg*, 492 U.S. 33, 51 (1989).

### Concurring Opinion Text

#### Concur By:

Rader, J., concurring in the judgment.

The result in this case is the same whether or not claim construction may sometimes involve subsidiary fact issues. In this case, the claims, specification, and prosecution history irrefutably show that cash transaction totals are not "inventory." Inventor Markman's "after-the-fact testimony" to the contrary "is of little weight compared to the clear import of the patent disclosure itself." *North Am. Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 1577, 28 USPQ2d 1333, 1337 (Fed. Cir. 1993), *cert. denied*, 114 S. Ct. 1645 (1994). The testimony of Markman's patent law expert is not evidence at all. Cf. *Nutrition 21 v. United States*, 930 F.2d 867, 871 n.2, 18 USPQ2d 1347, 1350 n.2 (Fed. Cir. 1991). In sum, the record lacks substantial evidence supporting Markman's asserted claim interpretation. Thus, the trial court correctly granted judgment as a matter of law that Westview did not infringe. See *Read Corp. v. Portec, Inc.*, 970 F.2d 816, 821, 23 USPQ2d 1426, 1431 (Fed. Cir. 1992). To dispose of this case, this court need not decide whether subsidiary fact issues may sometimes arise. Markman cannot manufacture a fact issue where none exists. This court's extensive examination of subsidiary fact issues is dicta.

In commenting on this concurrence, the court claims that whether claim construction can involve subsidiary fact issues "is before us and it is our obligation to decide it." The

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court, however, neglects the logically antecedent question of whether substantial evidence

supports the jury finding rejected by the trial court. *See Reed*, 970 F.2d at 821. Where, as here, substantial evidence does not support the finding, it does not matter whether the issue is one of law or fact.

Whether claim construction can involve subsidiary fact issues is *not* before us. It is our duty *not* to rule on this question. The court should decline to answer a question better left to a case that truly raises it, and therefore provides an informed basis for its resolution.

Transaction totals are not, as a matter of law, "inventory." Westview infringes only if transaction totals are "inventory." Therefore, the district court correctly granted judgment as a matter of law that Westview does not infringe. I concur in the judgment.

### Dissenting Opinion Text

#### Dissent By:

Newman, J., dissenting.

#### I INTRODUCTION

The issue is the role of the jury in patent infringement cases. The majority opinion resolves the issue by designating, as law, factual disputes about the meaning and scope of the technologic terms and words of art used to define patented inventions. By holding that these disputed technologic questions are matters of law, the court holds that issues of patent infringement, previously triable to a jury as of right, will now be decided by the trial judge and then re-decided *de novo* by this court on appeal.

Patent infringement is a factual question. Its resolution often requires finding the factual meaning and scope of the terms of scientific art and technology and usage by which the patentee described and claimed the invention. These findings usually require testimonial and documentary evidence and occasionally experiments or demonstrations, as illustrated in many of our previous decisions that are now overruled.

Deciding the meaning of the words used in the patent is often dispositive of the question of infringement. Thus in the case at bar the infringement controversy is decided by finding the meaning and scope of the term "inventory" in Markman's patent, in light of the accused Westview system: if "inventory" is limited to clothing, the patent is not infringed; if "inventory" includes invoices, it is. The majority holds that this is a matter of law, devoid of any factual

component; and subject to *de novo* appellate determination. The jury is eliminated, and new and uncertain procedures are imposed on trial judges.

This holding not only raises a constitutional issue of grave consequence, but the court creates a litigation system that is unique to patent cases, unworkable, and ultimately unjust. Thus I must, respectfully, dissent.

I shall discuss three principal concerns:

1. *The Meaning of Disputed Technologic Terms and Words of Art*

Patents are technologic disclosures, written by and for the technologically experienced: those "of skill in the art." The meaning and scope of the terms that define the patented technology is often in dispute in infringement litigation, for it often decides the case. In resolving such dispute the trier of fact often makes findings that depend on the weight, credibility, and probative value of conflicting evidence, such as that offered on behalf of Markman and Westview. Heretofore, the disputed meaning of technologic terms and words of art has been treated by Federal Circuit precedent as an "underlying fact" on which the legal effect of the patent is based. The majority now simply rules that these are not "underlying factual inquiries." However, the meaning and scope of disputed technologic and other terms of art in particular usage are classical questions of fact. Their nature as fact does not change because their finding, like most findings in litigation, has a legal consequence. By redesignating fact as "law" the court has eliminated the jury right from most trials of patent infringement.

2. *The Trial and Appellate Roles in Technologic Disputes*

The trial process is the vehicle for determining truth. Thus the trier of fact is present in the courtroom along with the witnesses, the advocates, the exhibits, and the demonstrations. Indeed, when the technologic issues are complex, appellate fact finding is probably the least effective path to accurate decisionmaking. And if a factual question is technologically simple, it is not thereby transformed into a matter of law and removed from the trial process. Even were there no constitutional infirmity, I doubt that the correct resolution of technologic or scientific disputes is more likely to be achieved by removing disputed facts from the procedures of trial and consigning them to the appellate court. Appellate briefs and fifteen minutes per side of attorney argument are not designed for *de novo* findings of disputed technologic questions.

3. *The Constitution* Jury trial in patent cases is protected by the Seventh Amendment. Elimination of the jury is not this court's choice to make.



The constitutional right alone bars the majority's new rule. The majority today denies 200 years of jury trial of patent cases in the United States, preceded by over 150 years of jury trial of patent cases in England, by simply calling a question of fact a question of law. The Seventh Amendment is not so readily circumvented.

## II FACT AND LAW IN PATENT INFRINGEMENT

### A. *LEGAL "CONSTRUCTION" v. FACTUAL "INTERPRETATION"*

The majority's explanation for removing these factual issues from the jury is that it is "construing" the patent claims, and that the "construction" of documents is a matter of law. The legal construction of documents--patent documents and other documents--is indeed a matter of law. The legal effect of the patent claim is to establish the metes and bounds of the patent right to exclude; this is a matter of law. But this does not deprive the underlying facts of their nature as fact. These facts are found on evidence that includes the patent specification, relevant prior art, the prosecution history, the testimony of experts in the field, and other relevant evidence such as tests and demonstrations, all as I shall discuss *post*. These findings do not become rules of law because they relate to a document whose legal effect follows from the found facts.

An extensive body of law, statutory and judgemade, governs the construction and legal effect of patent claims; for example, that a claim is construed the same way in determining both patent validity and infringement; that a dependent claim includes all of the limitations of the independent claim; that the claims as filed are part of the technical disclosure; that the right to exclude is divisible into making, using, or selling the claimed subject matter; that a claim is not infringed unless every element thereof is met in the accused device, either literally or by an equivalent. These and other rules of law are applied when appropriate to the facts of the particular case: either undisputed facts, or facts that are found by the trier of fact. The procedure of applying law to facts does not convert the finding of facts into a matter of law.

In patent infringement litigation there is often a factual dispute as to the meaning and scope of the technical terms or words of art as they are used in the particular patented invention. When such dispute arises its resolution is not a ruling of law, but a finding of fact. Such findings of meaning, scope, and usage have been called the "interpretation" of disputed terms of a

document, as contrasted with the "construction" or legal effect of a document. Professor Corbin has explained this distinction, in the context of contracts, as reflecting the difference between "language" and the "legal operation" of language:

It may be helpful to note that the word interpretation is commonly used with respect to *language* itself -- to the symbols (the words and acts) of expression. In about the same degree, we speak of the construction of a *contract*. It is true that we also speak of construing language and of interpreting a contract; but by the latter phrase is certainly meant interpreting the *words* of a contract. The word "contract" has been variously defined; but it is seldom identified with mere symbols of expression. By "interpretation of language" we determine what ideas that language induces in other persons. By "construction of the contract," as that term will be used here, we determine its legal operation -- its effect upon the action of courts and administrative officials.

3 Arthur L. Corbin, *Corbin on Contracts* Section 534 (1960) (footnotes omitted). The *Restatement (Second) of Contracts* Section 200 and Comment c (1981) describes the distinction between "construction" and "interpretation" as reflecting the difference between the "meaning" of a term and its "legal effect":

Interpretation of a promise or agreement or a term thereof is the ascertainment of its meaning.

\* \* \* Interpretation is not a determination of the legal effect of words or other conduct.

The Reporter's Note explains that the purpose is "to make it clear that 'interpretation' relates to meaning and to avoid confusion with the ascertainment of legal operation or effect, sometimes called 'construction.'" (Citations omitted.) The analogy is apt, although a patent is not a contract, for this distinction has been recognized for many kinds of written instruments. *See, e.g., In re XTI Xonix Technologies Inc.*, 156 Bankr. 821, 829 n.6 (D. Ore. 1993) (proceeding in bankruptcy):

Interpretation and construction of written instruments are not the same. A rule of construction is one which either governs the effect of an ascertained intention, or points out what the court should do in the absence of express or implied intention, while a rule of interpretation is one which governs the ascertainment of the meaning of the maker of the instrument.

*Williams v. Humble Oil & Ref. Co.* , 432 F.2d 165, 179 (5th Cir. 1970), *cert. denied* , 402 U.S. 934 (1971) (contract):

In the law of contracts (conventional obligations) a proper distinction exists between the "interpretation" of written instruments and their "construction." "Interpretation" refers to the process of determining the meaning of the words used; that process is traditionally thought to be a function of the jury. On the other hand, the process of determining the legal effect of the words used -- once we know their meaning -- is properly labelled "construction"; it is peculiarly a function of the court.

*Hornick v. Owners Ins. Co.* , 511 N.W.2d 370 (Iowa 1993) (insurance policy):

Construction of an insurance policy--the process of determining its legal effect--is a question of law for the court. Interpretation--the process of determining the meaning of words used--is also a question of law for the court unless it depends on extrinsic evidence or a choice among reasonable inferences to be drawn.

*In re Union Trust Co.* , 151 N.Y.S. 246, 249-50 (Sur. Ct. 1915) (will):

A rule of construction is one which either governs the effect of an ascertained intention or points out what a court should do in the absence of express or implied intention. A rule of interpretation is one which governs the ascertainment of the meaning of the maker of a written document.

*Reed v. Proprietors of Locks & Canals on Merrimac River* , 49 U.S. (8 How.) 274, 288-89 (1850) (deed):

It is true, that it was the duty of the court to give a construction to the deed in question, so far as the intention of the parties could be elicited therefrom. . . . But after all this is done, it is still a question of fact to be discovered from evidence dehors the deed . . . for the jury to decide, whether the land in controversy is included therein, or, in other words, was *intended* by the parties so to be.

It is indeed well understood that the legal effect or construction of the terms of a document, a matter of law, is not to be confused with resolution of disputes concerning the factual meaning of the terms. The former is for the court, the latter for the jury. That the thing whose terms require interpretation is a patent, instead of a deed or a will or a contract, does not convert the finding of disputed facts into a matter of law. Factual findings concerning a particular patented invention do not become matters of law simply because the patent document serves a legal purpose.

Although purity of language has occasionally slipped, for the words "construction" and "interpretation" have been loosely used, the distinction between the concepts has been recognized when it mattered. For example, Walker in his 1904 *Textbook* used the phrase "construction of the patent," but he left no doubt as to the role of the jury as trier of fact: [W]here the question of infringement depends on the construction of the patent, and that construction depends upon a doubtful question in the prior art, the latter question should be left for the jury; and the dependent question of infringement should also be left for the jury to decide.

A.H. Walker, *Textbook on the Patent Laws of the United States of America* Section 536 (4th ed. 1904).

This recognition that the factual issues that underlie the "construction of the patent," and that determine patent infringement, are for the jury is manifest even in the early Supreme Court cases that are relied on by the majority, as I discuss in Part IV-C, *post*. The majority's authority does not show removal of factual disputes from the jury. Indeed, several of the cases that are relied upon were bills in equity, and irrelevant to jury trials.

#### B. EVIDENCE RELEVANT TO CLAIM INTERPRETATION

The areas of evidentiary inquiry commonly encountered in patent infringement cases are illustrated in Markman's case. The infringement trial (validity and damages were severed) included evidence relating to the patent specification, the patent claims, the prosecution history, the inventor's usage of "inventory," and the defendant's understanding of the term. Although Markman's invention was not complex, this phase of the trial took three days.

##### 1. *The Specification*

The patent specification contains the description of the invention, including the claims. It fulfills the inventor's obligation to make known the technology for which the patent is granted, and must meet certain legal requirements. It must be written, and clear. It must be complete yet concise. It must enable one of skill in the field to make and use the invention, but need not include that which is known to the field. It must describe the best mode known to the inventor. It is a technical document, written for persons experienced in the technology. See 2 Irving Kayton et al., *Patent Practice* 9-1 to 9-3 (4th ed. 1989) (describing thirteen functions of the patent specification).

The claims are part of the specification. Their purpose is to identify -- "particularly pointing out and distinctly claiming," 35 U.S.C. Section 112 -- that which is the subject of the patent grant. Patent claims are terse summaries, and do not repeat the technologic content of the specification. When there arises a question as to whether a term in a patent claim is of a meaning and scope that reaches particular subject matter, the interested public and in turn the courts look to the body of the specification for elaboration and illustration of the usage of the term to define the patented technology.

When litigation ensues, it may be helpful to the trier of fact to hear from the inventor what he/she meant by the terms of art and science and technology used to describe the invention. Markman, as the inventor, testified on this aspect. It may also be helpful to hear, from others in the field of the invention, what was conveyed to them by the now-disputed terms. Markman's witness and Westview's president so testified. Not unexpectedly, the evidence was conflicting. The trier of fact may have to assess the technical content, weight, and credibility of all of the evidence, including but not limited to the specification, in finding the meaning and scope of disputed terms as used in the patent. Whether the term "inventory" in Markman's Claim 1 includes Westview's invoices can not be found in the abstract, nor by consulting a dictionary; it is found on the evidence of this case, for the specific invention and the specific accused system. This has historically been a question of fact. <sup>1</sup>

The Federal Circuit has explained the relationship between law and fact in claim interpretation in many cases, all now overruled, as I illustrate in Part IV-A,B, *post*. For example, in *Perini America, Inc. v. Paper Converting Mach. Co.*, 832 F.2d 581, 4 USPQ2d 1621 (Fed. Cir. 1987) the patented invention related to machines having embosser rolls used in manufacturing paper towels. Typical of the technologic terms in dispute was "the projections in one web intermediate the projections in the other web" to describe the alignment of the embosser rolls. This court recognized that the meaning of this term was a factual issue, and explained that claim interpretation rests on underlying facts:

Like all legal conclusions, that conclusion [that a claim must be interpreted in a certain way] rises out of and rests on a foundation built of established (undisputed or correctly found) facts. Interpretation of a claim, or of its scope, should not be assayed until a foundation is in place. If the meaning of terms in the claim, the specification, other claims, or prosecution history is

disputed, that dispute must be resolved as a question of fact before interpretation can begin.

*Id.* at 584, 4 USPQ2d at 1624. The court observed that the finding of disputed facts can "dictate" the ultimate conclusion of what the claim means:

Confusion may be caused by the circumstance in which resolution of the question of the meaning of a term or terms dictates the interpretation of the claim, but that is not unusual, legal conclusions being dictated by established facts and not the other way around, and does not change the nature of the meaning-of-terms inquiry from one of fact to one of law.

*Id.* The majority now criticizes and expressly overrules these statements in *Perini*, holding that these facts are not fact, but "law," and that they are removed from the trier of fact and are determined *de novo* on appeal. In my view the *Perini* court's analysis is in accord with precedent, and properly preserves the role of the trier of fact, whether trial is to the bench or to a jury.

## 2. Prior Art

When there is a dispute as to the meaning and scope of a technologic term or word of art in a patent claim, it is often helpful to look at the prior art: that is, what was known to persons in the field of the invention at the time the invention was made. The scope and content of the prior art, the differences between the claimed invention and the prior art, the level of ordinary skill in the field of the invention, are all questions of fact, *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), and are not subject to reclassification by us. 2

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The prior art may provide evidence of how the disputed technologic terms and words of art or science were used by others in the field of the invention, and thus evidence of what was conveyed to the field by the terms as used by the patentee. Indeed, the infringement analysis can sometimes stop with the prior art, for if the accused device is found in the prior art, then it is a rule of law that the patent claims can not be interpreted to reach that device. This too requires findings of the scope and content of the prior art, a question of fact, *Graham v. John Deere*, that is found with an eye upon the accused device.

I do not attempt to catalogue the myriad kinds of information, findings, and inferences that may flow from the prior art, in determining the technologic scope of the patentee's invention. This

evidence, and the findings and inferences that are drawn, are the province of the trier of fact. The majority's insistence that these are purely legal matters of "claim construction" does indeed serve to replace the trier of fact with the Federal Circuit; I doubt that it improves the quality of the decision, at great cost to efficiency of the trial/appellate process.

### 3. *The Prosecution History*

The prosecution history is the record in the Patent and Trademark Office of what transpired during examination of the patent application. It is a public record. It sometimes is lengthy and detailed, sometimes sketchy and brief. The prosecution history may provide evidence of how the inventor or the patent examiner viewed the now-disputed technologic and other terms. In *Howes v. Medical Components, Inc.*, 814 F.2d 638, 645, 2 USPQ2d 1271, 1274-75 (Fed. Cir. 1987) this court observed that "during the prosecution of a patent, claim language may take on new meanings, possibly different from that which was originally intended." The way patentability was argued by the inventor, concessions made or positions adjusted, may be relevant to the factual issue in dispute, and may create an estoppel against the patentee's now-proposed interpretation.

The determination of what occurred in the prosecution of the patent application is a factual matter, *SmithKline Diagnostics Inc. v. Helena Lab. Corp.*, 859 F.2d 878, 882, 8 USPQ2d 1468, 1471-72 (Fed. Cir. 1988), specific to the particular patent. It is often based on technological arguments, experimental evidence submitted to the patent office, discussions of the meaning and relevance of prior publications and prior knowledge, explanations of the technical content of the specification, and other evidence of the applicant's and the examiner's positions. This evidence, and appropriate findings and inferences, are for the trier of fact.

The majority refers to the "undisputed" prosecution history, in asserting that there are no factual aspects to this evidence. Indeed, the official government record is fixed. But the significance of the exchanges, compromises, and explanations contained in the correspondence between the inventor and the examiner; the inferences to be drawn as to the technology, the invention, and the meaning and scope of now-disputed technologic terms or words of art; may depend on this and other evidence. If disputed, their finding is for the trier of fact. The meaning, significance, and weight of the content of a documentary record does not become a matter of law simply because the content of the record is not in dispute.

### 4. *Technologic/Scientific Facts*

Decision of the question of patent infringement usually turns on findings of technologic fact;

sometimes relatively simple technology, sometimes at the frontier of scientific advance and its practical applications. When scientific and technologic disputes arise in litigation, they are subject to the rules of evidence and procedure. See *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S. Ct. 2786 [ 27 USPQ2d 1200 ] (1993) (discussing issues of scientific evidence). The complexity of the technologic/scientific evidence will of course vary with the issue. See, e.g., *Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555, 24 USPQ2d 1402 (Fed. Cir. 1992) (color video display semiconductor chips); *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991) (blood clotting factor VIII); *Halliburton Co. v. Schlumberger Technology Corp.*, 925 F.2d 1435, 17 USPQ2d 1834 (Fed. Cir. 1991) (neutron logging of oil wells); *Bey v. Kollonitsch*, 806 F.2d 1024, 231 USPQ 967 (Fed. Cir. 1986) (irreversible enzyme inhibitors); *Fromson v. Advance Offset Plate, Inc.*, 755 F.2d 1549, 225 USPQ 26 (Fed. Cir. 1985) (silicated lithography plates).

The Court stressed in *Daubert* that the admissibility of scientific evidence depends on its reliability and relevance, and that the judge's responsibility, when the trier of fact is a jury, is to assure the adequacy of the methodology upon which the evidence is

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based. 113 S. Ct. at 2795-96. This emphasis on methodology is as well suited to practical applications of technology and engineering as to basic scientific principles. Evidence in patent cases is often provided by scientists or engineers as expert witnesses, and may include explanations of the technology and its scientific basis, comparisons with the prior art or with the accused device, experiments, demonstrations, and interpretations. The evaluation of technologic evidence is often required of the trier of fact. See Lee Loevinger, *Science as Evidence*, 35 *Jurimetrics J.* 153 (1995); Jack B. Weinstein, *The Effect of Daubert on the Work of Federal Trial Judges*, 2 *Shepard's Expert and Scientific Evidence Quarterly* 1 (1994).

Nor is it rare in patent cases to encounter incomplete data, theoretical uncertainties, untested inferences, and speculative conclusions. Experimental procedures, the sources of data, and the bases of opinions that are offered to prove/disprove a technologic fact are often in evidentiary conflict in patent disputes. Engineers and scientists know very well the uncertainties of the experimental process, the fluctuations and glitches in the data, the human and machine error, the



forks in the road to objective truth. Indeed, understanding of the fallibility of technologic and scientific experimentation is soon acquired by those who labor in the field of litigation. "The community of trial lawyers and judges knows perhaps better than any other professional group just how unruly science often is in practice." Sheila Jasanoff, *What Judges Should Know About the Sociology of Science*, 77 *Judicature* 77, 80 (1993) (discussing the "social dimension [that] gives legitimacy to particular scientific 'facts'").

Now that the Federal Circuit holds that resolution of disputes as to the meaning and scope of technologic terms and words of art as used in a particular patent is law, not fact, removing the jury from this issue, is the trial judge excused from determining the admissibility and relevance of technologic evidence? What about the requirement that "[c]redibility determinations, the weighing of the evidence, and the drawing of legitimate inferences from the facts are jury functions, not those of a judge." *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255 (1986). In a patent case the trier of fact may receive extensive evidence related to the meaning and scope of technologic or scientific terms or words of art, their usage and their perception in the field of a particular invention. The evidence often includes technical publications, scientific articles, experimental data, demonstrations, and opinion testimony. The factual nature of such evidence can not be squared with the majority's criticism of such cases as *Palumbo v. Don-Joy*, 762 F.2d 969, 226 USPQ 5 (Fed. Cir. 1985), which is today overruled for its holding that "when the meaning of a term in a claim is disputed and extrinsic evidence is necessary to explain that term, then an underlying factual question arises." *Id.* at 974, 226 USPQ at 8. In addition to my concern about how a record will be developed for the Federal Circuit's *de novo* decision, I doubt that an appellate court's *de novo* finding of technologic facts is more likely to attain accuracy, than the decision of a jury or judge before whom a full trial was had:

Duplication of the trial judge's efforts in the court of appeals would very likely contribute only negligibly to the accuracy of fact determination at a huge cost in diversion of judicial resources.

*Anderson v. City of Bessemer City*, 470 U.S. 564, 574-75 (1985).

#### 5. *The Testimony of Experts*

Disputed questions of the meaning and scope of technologic terms and words of art are decided from the viewpoint of persons of skill in the specific field of technology. It is rare to come upon a technologic issue in litigation for which differing and often plausible views are not offered by qualified witnesses. The Federal Rules of Evidence contemplate the provision of specialized knowledge to assist the trier of fact:

R. 702 If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto. . . .

In *Moeller v. Ionetics, Inc.*, 794 F.2d 653, 229 USPQ 992 (Fed. Cir. 1986) this court held that the trial court's rejection of expert testimony in that case was an abuse of discretion:

Although use of experts is generally a matter of discretion with the trial judge, that discretion is not unlimited. In a patent case involving complex scientific principles, it is particularly helpful to see how those skilled in the art would interpret the claim.

*Id.* at 657, 229 USPQ at 995 (citations omitted). In *Moeller* the claims related to an electronic process for measuring the concentration of cations, the dispute centering on the particular meaning of the term "electrode body." *Moeller* too is now criticized and overruled for its statement that

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although claim construction is a legal question, underlying fact disputes may arise pertaining to extrinsic evidence that might preclude summary judgment treatment of claim construction.

*Id.* (citation omitted). I do not see how the Federal Circuit could have decided, *de novo* on appeal, the meaning of "electrode body" in this particular invention without finding disputed technologic facts.

The majority's stated recognition that expert testimony may be useful, while holding that "extrinsic evidence of record cannot be relied on to change the meaning of the claims," majority op. at 26, denying all deference to the trier of fact's findings based on that evidence, illustrate the confusion in the court's plan of *de novo* claim interpretation as a matter of law. The majority has created a procedural quandary, for extrinsic evidence can apparently be received, but no jury can weigh it. When the extrinsic evidence is in conflict -- as it invariably is--what then? Will the Federal Circuit itself weigh the evidence of expert witnesses? Will we receive a collection of self-serving affidavits, without examination and cross-examination? Such a procedure surely is not optimal for cases that may require decision of complex engineering or electronics, or chemical or biological processes.

The Court in *Daubert* referred to the value of the adversary system in matters of scientific

proof. The cross-examination of technical experts, with the adversarial guidance of other technical experts, can be as rigorous as any "peer review" process. *See generally* Margaret A. Berger, *Procedural Paradigms for Applying the Daubert Test*, 78 Minn. L. Rev. 1345 (1994). In resolving litigation controversy by determining mechanical or chemical or electronic truth, it is hard to understand why justice should be handicapped in the Federal Circuit by replacement of a live trial with cold documents.

In eliminating all sources of "fact" that might implicate the jury right, the majority has denied to the trial of patent cases the assistance that Federal Rule of Evidence 702 is designed to provide, as well as the benefits of Rules 403, 703, and 706. The purpose of these rules is "that the truth may be ascertained and proceedings justly determined." Fed. R. Evid. 102. It seems to me that we have constructed a Hobson's choice whereby either (1) there will indeed be factual evidence of technologic meaning entered into the trial record, for *de novo* decision on the record by the Federal Circuit, (2) there will be scant evidence admitted at trial, in view of our pronouncement that there is only law in claim interpretation. Either way, one might call this the "omniscience of the learned man" theory of dispute resolution in the Federal Circuit. 3

Findings of the meaning of technologic terms and words of art in particular usages are the province of the trier of fact. Discussing words and their jurisprudential treatment, Justice Holmes wrote:

A word is not a crystal, transparent and unchanged; it is the skin of a living thought and may vary greatly in color and content according to the circumstances and the time in which it is used.

*Towne v. Eisner*, 245 U.S. 418, 425 (1918). In *Autogiro Co. of America v. United States*, 384 F.2d 391, 397, 155 USPQ 697, 702 (Ct. Cl. 1967) one of our predecessor courts remarked: "The very nature of words would make a clear and unambiguous [patent] claim a rare occurrence." Justice Story explained the roles of judge and jury with respect to the meaning of "words of art, and technical phrases" in patent documents:

In respect to another objection, viz. that the court was bound to state what in point of law the invention claimed by the patentee was, I agree, that this is generally true, so far as the construction of the words of the patent, and specification is concerned. But then this doctrine is to be received with qualifications, and sub modo, as the very opinion of Mr. Baron Parke, cited by the counsel, in the case of *Neilson v. Harford*, Webster Pat. Cas. 295, 370,[ 4 ] abundantly shows; and *the jury are to judge of the meaning* of words of art, and technical phrases, in commerce and manufactures, and of the surrounding circumstances, which may

materially affect, enlarge or control the meaning of the words of the patent and specification.

*Washburn v. Gould*, 29 F. Cas. 312, 325 (C.C.D. Mass. 1844) (emphasis added). Justice Story recognized that the meaning of words of art may depend on "the surrounding circumstances." Indeed, the Federal Circuit recognized that words do not always have the same meaning when they are adapted to new uses. See *Fromson v. Advance Offset Plate, Inc.*, 720 F.2d 1565, 1569, 219 USPQ 1137, 1140 (Fed. Cir. 1983) (patentee may be his own lexicographer).

Inventors' usages of words to describe their inventions, and the meaning thereby conveyed to persons skilled in the field, are

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questions of fact, not matters of law, in patent documents as in other written instruments. Disputes concerning the meaning and usage of technical terms and words of art arise in many areas of law. These disputes are resolved by the triers of fact, whether judge or jury, in their established roles in the adjudicatory process. For example, the role of the jury with respect to technical terms in a contract for drilling oil wells was explained in *Startex Drilling Co. v. Sohio Petroleum Co.*, 680 F.2d 412 (5th Cir. 1982):

It is more apt to say that the undefined technical terms on which the contract's application to the present dispute depends convey little meaning without explanation. So, while we agree with Sohio that we are free to determine the ambiguity question anew, we also affirm the district court's ruling that the contract is ambiguous. Thus it was proper to submit to the jury the evidence from both sides as to the meaning attached to these technical terms by the parties, and by the industry.

*Id.* at 415 (citation omitted). In *Zell v. American Seating Co.*, 138 F.2d 641 (2d Cir. 1943), Judge Frank wrote for the court that:

Thayer delightfully described the fatuous notion of a "lawyer's Paradise, where all words have a fixed, precisely ascertained meaning; where men may express their purposes, not only with accuracy, but with fullness; and where, if the writer has been careful, a lawyer, having a document referred to him, may sit in his chair, inspect the text, and answer all questions without raising his eyes."

*Id.* at 648 n.26 (quoting Thayer, *A Preliminary Treatise on Evidence* (1898)).

It has not heretofore been seriously challenged that findings of the weight and credibility of evidence are for the jury, whether the issues are technologic, scientific, or otherwise. See *Sartor v. Arkansas Natural Gas Corp.*, 321 U.S. 620 (1944):

[The weight and credibility of a witness' testimony] "belongs to the jury, who are presumed to be fitted for it by their natural intelligence and their practical knowledge of men and the ways of men; and so long as we have jury trials they should not be disturbed in their possession of it, except in a case of manifest and extreme abuse of their function."

*Id.* at 628 (quoting *Aetna Life Ins. Co. v. Ward*, 140 U.S. 76, 88 (1891)). In *Railroad Dynamics, Inc. v. A. Stucki Co.*, 727 F.2d 1506, 220 USPQ 929 (Fed. Cir.), cert. denied, 469 U.S. 871 (1984) this court instructed a party who sought *de novo* appellate review after a jury trial:

Thus [Railroad Dynamics] misconceives our role as an appellate court. In the concert hall of justice, each musician has a part to play. When one on whom plays not his own but another's part, discord is certain. Moreover, our parts are played under well defined rules.

*Id.* at 1514, 220 USPQ at 937.

Implementing this court's departure from the established appellate role, in reviewing Markman's case on this appeal the majority does not mention the jury instructions, or discuss whether a reasonable jury could have reached the verdict that was reached on the evidence adduced, or decide whether there was substantial credible evidence of such content and weight as could support the jury's verdict. The majority finds for itself the disputed fact of whether the term "inventory" includes the invoices of the Westview system, without any deference to the trial process. Whether or not this court believes that it is a superior finder of technologic fact, that is not our place in the judicial structure.

I wonder how this new system will work. The majority states that the trial judge should have decided the meaning of "inventory" before giving the case to the jury, 5 but that the error was harmless since the trial judge reached the correct meaning "as a

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matter of law" after the jury verdict. There was no return to the jury after the trial judge re-decided what "inventory" meant, making the jury superfluous. The Federal Circuit now decides *de novo* whether "inventory" includes "invoices," ignoring the trial. What of the

trial process, if trial judge and jury are ciphers upon appellate review? In the Introduction to the *Reference Manual on Scientific Evidence* (1994), Judge Schwarzer wrote:

The bedrock of [the justice] system is the adversary process, which depends on attorneys to present evidence on behalf of their clients, judges to make the necessary and appropriate rulings concerning admissibility, and juries to resolve disputed issues of fact.

*Id.* at 1.

In patent cases, no less than for other causes of action, it is the trier of fact on whom the system of justice is founded. The extensive exposition of disputed facts that is available at trial can not be duplicated on appeal. Even were there no constitutional infirmity, I can discern no practical benefit sufficient to justify this court's departure from the established procedures of trial and appeal. Implicit in the appellate process is an expected degree of deference to the trial process. The majority's elimination of the jury as trier of fact, and elimination of the deference owed to the judge upon bench trial of disputed facts, removes from the parties the benefit of the trial process. It distorts the trial/appellate relationship in a manner unique to patent litigation, and manifests a heady misperception of our assignment as a national appellate court.

C. THE "CLASSIFICATION POWER" -- TURNING FACT INTO LAW

Commentators have remarked on the temptation of appellate courts to redefine questions of fact as questions of law in order to impose the court's policy viewpoint on the decision. Professor Martin Louis calls the appellate assertion of power to treat fact as law "drastic in that it amounts to a direct judicial assault on the prerogatives of fact finders." Martin B. Louis, *Allocating Adjudicative Decision Making Authority Between the Trial and Appellate Levels: A Unified View of the Scope of Review, the Judge/Jury Question, and Procedural Discretion*, 64 N.C. L. Rev. 993, 1018 (1986). Louis observes that the "classification of ultimate facts as questions of law amounts to a manipulation of the law-fact doctrine to take questions from the jury or to subject the trial level's resolution of questions to free appellate review." *Id.* at 1028. Although the Seventh Amendment has provided a safeguard against this autocracy of the judiciary, concerned observers have long counselled vigilance. Thus definitions of fact and law--the methodology of this appellate power--have attracted the attention of legal scholars.

"Law" is usually defined as a statement of the general principle or rule, predicated in advance, awaiting application to particular facts as they may arise. See Francis H. Bohlen, *Mixed Questions of Law and Fact*, 72 U. Pa. L. Rev. 111, 112 (1924). Louis, *supra*, at 994, states the principle:

Declarations of law are fact-free general principles that are applicable to all, or at least to many, disputes and not simply to the one sub judge.

There is an additional element to "law;" that is, the duty of judicial enforcement. As Professor Thayer explained, "nothing is law that is not a rule or standard which it is the duty of judicial tribunals to apply and enforce." James B. Thayer, *"Law and Fact" in Jury Trials*, 4 Harv. L. Rev. 147, 153 (1890).

Thayer defines "fact" as follows:

["Fact"] is what Locke expresses when he speaks of "some particular existence, or, as it is usually termed, matter of fact." The fundamental conception is that of a thing as existing, or being true. It is not limited to what is tangible, or visible, or in any way the object of sense; things invisible, mere thoughts, intentions, fancies of the mind, propositions, when conceived of as existing or being true, are conceived of as facts. The question of whether a thing be a fact or not, is the question of whether it is, whether it exists, whether it be true. All inquiries into the truth, the reality, the actuality of things are inquiries into the fact about them.

*Id.* at 151-52. A compilation of definitions of "fact" is provided in *Black's Law Dictionary* 591-92 (6th ed. 1990):

A thing done; an action performed or an incident transpiring; an event or circumstance; an actual occurrence; an actual happening in time or space or an event mental or physical; that which has taken place.

....

.... "Fact" means reality of events or things the actual occurrence or existence of which is to be determined by evidence.

In sum, the law is a general proposition, while the fact is a case-specific inquiry. Clarence Morris, *Law and Fact*, 55 Harv. L. Rev. 1303, 1304 (1942), observed that a controlling distinction between law and fact is whether evidence is needed, for a question

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of fact usually calls for proof, whereas matters of law are established not by evidentiary showing but by intellectual abstraction.

These distinctions have often been discussed, usually in the course of considering the complexities that can arise, and how they have been, or should be, treated. Thus commentators

and judges have written to explain the distinctions among historical facts, ultimate facts, and mixed law/fact questions, in the course of relating these distinctions to trial procedures and judicial review. The nicety that has been generated was criticized in *Armour & Co. v. Wilson & Co.*, 274 F.2d 143, 124 USPQ 115 (7th Cir. 1960), as follows:

We have come to speak of questions of "fact," "primary facts," "subsidiary facts," "evidentiary facts," "ultimate facts," "physical facts," "documentary facts," "oral evidence," "inferences," "reasonable inferences," "findings of fact," "conclusions," "conclusions of law," "questions of fact," "questions of law," "mixed questions of law and fact," "correct criteria of law," and so on *ad infinitum*. The simple answer is that we are all too frequently dealing in semantics, and our choice of words does not always reflect the magic we would prefer to ascribe to them.

274 F.2d at 155, 124 USPQ at 124-25 (footnote omitted). See generally Steven A. Childress & Martha S. Davis, *Federal Standards of Review* (2d ed. 1992).

The character of what is a fact does not change, even in those special cases that have been held to warrant plenary appellate review. 6 The subject matter that the majority now designates as "law" -- the disputed meaning and scope of technologic terms and words of art as used in particular inventions -- is not law, but fact. On any definition of fact and law, the question of whether "inventory" as used in Markman's Claim 1 means only clothing or can include invoices is a question of fact: on Thayer's criterion of whether the fact exists; on Morris' criterion of whether there is a need for evidence; on Bohlen's inquiry of whether the meaning is specific to the situation *sub judice*. The meaning of "inventory" is specific to this invention, this patent, this claim, this system, this defendant. Its determination is for the trier of fact.

### III THE CONSTITUTION

The most egregious lapse in the majority's ruling is its discard of the jury right in patent cases. As I said at the outset, patent infringement has been tried to a jury in the United States for two hundred years, and in England since at least 1623. Disputes concerning "letters patent" for inventions were tried in the English courts, as for other forms of letters patent, as I shall illustrate. Patent infringement trials at common law included determination of validity as well as infringement. Whatever version of "law/fact" this court now chooses to adopt, it can not redact the history of jury trials. The judicial obligation to safeguard the constitutional right is not defeasible by calling a patent a "statute," or otherwise diminishing the vitality of the Seventh Amendment.



Thus the court, sitting *en banc* to overrule its contrary precedent, removes the jury from its role as the trier of fact. That right is assured by the Seventh Amendment:

In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury shall be otherwise re-examined in any Court of the United States, than according to the rules of the common law.

U.S. Const. amend. VII.

The importance of the jury right to the Framers can not be overemphasized. Alexander Hamilton wrote:

The friends and adversaries of the plan of the convention, if they agree in nothing else, concur at least in the value they set upon the trial by jury; or if there is any difference between them it consists in this: the former regard it as a valuable safeguard to liberty; the latter represent it as the very palladium of free government.

The Federalist No. 83, at 499 (Clinton Rossiter ed., 1961). In discussing the history of the jury in England and in the United States, Judge Arnold has explained:

It is almost impossible to exaggerate the centrality of the institution of the jury to almost all the important episodes of Anglo-American legal history. Many of the

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central ideas of the American and English common law owe their origin to the fact that the jury was the chief mechanism for trying factual disputes. It is the single most important institution in the history of Anglo-American law.

Morris Sheppard Arnold, *The Civil Jury in Historical Perspective*, in *The American Civil Jury* 9, 10 (1987).

The value that the Framers placed on this "palladium of free government" has been guarded by the courts:

Maintenance of the jury as a fact-finding body is of such importance and occupies so firm a place in our history and jurisprudence that any seeming curtailment of the right to a jury trial should be scrutinized with the utmost care.

*Dimick v. Schiedt*, 293 U.S. 474, 486 (1935).

The deference that courts give to jury verdicts is the mechanism by which the Constitution protects the jury right from encroachment by judges. It is not this court's option to violate that

right, whether by denying such deference or by taking from the jury the trial of factual issues. Whatever one's personal view of the relative capabilities of a jury and the Federal Circuit in finding technologic facts in patent cases, it is not within our authority to readjust that role to our taste:

The Seventh Amendment . . . requires that questions of fact in common law actions shall be settled by a jury, and that the court shall not assume directly or indirectly to take from the jury or to itself such prerogative.

*Walker v. New Mexico & So. Pac. R. Co.* , 165 U.S. 593, 596 (1897).

The Federal Circuit early affirmed its inheritance of this responsibility, as we undertook our assignment to provide nation wide uniformity in patent cases. In *Connell v. Sears, Roebuck & Co.* , 722 F.2d 1542, 1547, 220 USPQ 193, 197 (Fed. Cir. 1983) the court stated:

So long as the Seventh Amendment stands, the right to a jury trial should not be rationed, nor should particular issues in particular types of cases be treated differently from similar issues in other types of cases.

In *Railroad Dynamics v. Stucki* , 727 F.2d at 1515, 220 USPQ at 937, the court stated:

There is, of course, no reason for considering patent cases as somehow out of the mainstream of the law and rules of procedure applicable to jury trials for centuries under our jurisprudence.

In many ensuing decisions we reaffirmed this obligation. However, this court's fidelity to fundamental law slipped in recent years, culminating in today's trivializing of our heritage as we defeat the jury right in patent infringement cases.

#### A. THE HISTORICAL TEST

There are no fine lines to be drawn in interpreting the Seventh Amendment, for all cases at common law in England were tried to a jury. In explaining the "historical test," Justice Story described England as "the grand reservoir of all our jurisprudence":

Beyond all question, the common law here alluded to [in the Seventh Amendment] is not the common law of any individual state, (for it probably differs in all), but is the common law of England, the grand reservoir of all our jurisprudence. It cannot be necessary for me to expound the grounds for this opinion, because they must be obvious to every person acquainted with the history of the law.

*United States v. Wonson* , 28 F.Cas. 745, 750 (1812). The historical test assured the largeness of the embrace of the Amendment. I can find no support in history for the restriction today adopted. In England in 1791, as of at least 1623, actions of the "force and validity" of letters

patent were tried according to the rules of the common law.

Letters patent were grants of the Crown, made for a variety of purposes. During the 1500s to early 1600s, the Star Chamber considered all infringements of letters patent to be contempts of royal authority. See *Millar v. Taylor*, 4 Burr. 2303, 2374 (K.B. 1769) (contempt proceeding applied by the Star Chamber to infringement of "any patent the Crown thought proper to grant"); Coke, 3 Inst. 182-83 (discussing abuses). In 1623 the Statute of Monopolies prohibited all monopolies except patents for inventions, which continued to be granted for terms that were limited to fourteen years. Section 6 of the Statute stated:

6. Provided also, that any declaration before mentioned, shall not extend to any letters patents and grants of privilege for the term of fourteen years or under, hereafter to be made, of the sole working or making of any manner of new manufactures within this realm to the true and first inventor and inventors of such manufactures, which others at the time of making such letters patents and grants shall not use, so as also they be not contrary to the law nor mischievous to the state by raising prices of commodities at home, or hurt of trade, or generally inconvenient. . .

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21 Jac. I, c.3, s.6 (1623). 7 Section 2 of the Statute provided that the "force and validity" of the subject matter of the Statute shall be "examined, heard, tried, and determined" according to the common law:

2. And all monopolies, and all such commissions, grants, licenses, charters, letters patent, proclamations, inhibitions, restraints, warrants of assistance, and all other matters and things tending as aforesaid, and the force and validity of them, and every of them, ought to be, and shall be for ever hereafter examined, heard, tried, and determined, by and according to the common laws of this realm, and not otherwise.

21 Jac. I, c.3, s.2 (1623). Lord Coke explained that the purpose of Section 2 was to remedy the "mischief" of Star Chamber actions by placing the authorized grants under the common law. 3 Inst. at 183.

The litigation procedures that applied to letters patent for inventions did not differ from those applied to other letters patent. See Benjamin Vaughan Abbott, *Decisions on the Law of Patents for Inventions Rendered by English Courts* 8 n.2 (1887) (the rules for letters patent

stated in the case of *Rex v. Mussary* (K.B. 1738) were also generally applicable to letters patent for inventions). English cases of the period show similar procedures whether the subject was a charter, an invention, a literary work, a trademark, an interest in land, or a trade route.

Trial by jury was the way of the common law, and did not depend on the subject of the letters patent. See, e.g., *East India Company versus Sandys*, 1 Vern. 127 (Ch. 1682) (validity of grant of exclusive trade route tried to jury); *Mayor of Kingston upon Hull versus Horner*, 1 Cowp. 102, 108 (K.B. 1774) (dispute concerning meaning of terms of a charter from the Crown relating to a port "most proper to be left to the decision of the jury"); *Blanchard v. Hill*, 2 Atk. [2d ed. 1794] 484 (Ch. 1742) (injunction to restrain the use of a tradesman's mark granted by the Crown could not be issued without a hearing at law); *Anon*, 1 Vern. 120 (Ch. 1682) (the Lord Keeper (or Chancellor) required trial at law to determine the validity of letters patent for printing of the Bible); *Collins v. Sawrey*, 4 Bro. P.C. [2d ed. 1803] 692 (H.L. 1772) (rejecting argument that since the issue depended on written evidence, the "construction" of the letters patent for a vicarage was for the chancery court); *Donaldson v. Beckett*, 2 Bro. P.C. [2d ed. 1803] 129, 138 (H.L. 1774) ("Between such inventions and copies of books, no sensible distinction can be drawn."); *Millar v. Taylor*, 4 Burr. at 2323:

In letters patent, all conditions required by 21 Jac. 1 must be observed. Patentees for new inventions are left, by that statute, to the common law, and the remedies which follow in their nature.

There simply is no way, in 1995, to rewrite the history of England and the place of the jury under the common law in 1791.

Actions for infringement of letters patent for inventions were initiated either in the law courts or in Chancery, depending on the relief sought. 8 When equitable relief was sought, patent actions began with the filing of a bill in the Ordinary side of Chancery (called the Petty Bag or Latin Side), for that is where the letters patent were "enrolled." Issues relating to invalidity and noninfringement, if raised by the defendant, were directed by the Chancellor to the courts of law for trial to a jury, and then returned to Chancery if the verdict warranted. The procedure of filing a bill in Chancery and then trying the issue at law was explained by Davies:

[T]he Court of Chancery never decides upon the validity of a patent, the practice there being nothing more than to grant an injunction, at the prayer of the patentee, against any person infringing his patent, and to order an account of profits; but if any question arises upon the validity of the patent, novelty of the invention, or the sufficiency of the specification, it is uniformly referred to a court of law.

John Davies, *A Collection of the Most Important Cases Respecting Patents of Invention and the Rights of Patentees* ix (1816).

In infringement suits, the Chancery court could grant the patentee's bill seeking an injunction, or a writ of *scire facias* to repeal the patent, after trial to a jury in a court of law. See, e.g., *Brewster v. Weld*, 6 Mod. 229 (1704) (a *scire facias* to repeal letters patent may be sued in Chancery by any person prejudiced by a patent, as well as by the Crown; when Chancery issues writ returnable to Queen's Bench [requiring trial to a jury] Chancery neither has jurisdiction nor can it supersede such writ); *Rex v. Else*, 1 Carp. P.C. 103 (K.B., N.P. 1785) (proceeding brought by writ of *scire facias* to repeal patent on ground that there was no new invention described in the specification; tried in King's Bench wherein the jury rendered a verdict for the Crown). Not all matters required the Chancellor to direct issues to the law courts to be tried. For example, when the Crown granted letters patent, for invention or otherwise, the grant had to be enrolled in Chancery's Petty Bag Office within four months for the patent to be enforceable. Thus a bill could be filed in Chancery to seek equitable relief for a patentee's failure to enroll the patent before the time expired. E.g., *Ex parte Beck*, 1 Bro. P.C. [2d ed. 1803] 578 (Ch. 1784).

These relationships were well established by the date of the Seventh Amendment. Issues of patent infringement and validity were tried only to a jury, in the courts of King's Bench, Common Pleas, or Assize. In a common procedure the patentee would seek an injunction against infringement, the defendant would assert invalidity, and the matter would be directed to a court of law for trial. This process is illustrated in *Newsham v. Gray*, a patent infringement action that started with a bill in equity, seeking to enjoin Gray, the alleged infringer. The Lord Keeper directed the plaintiff to bring an action at law. The following is from Lord Chancellor Hardwicke's opinion in the subsequent proceeding in Chancery, where Gray was seeking to recover costs since the plaintiff was nonsuited for failure to prosecute:

The plaintiff had obtained letters patent of the crown for a new invention of fire engines.

A bill was brought by him to establish his letters patent, and for a perpetual injunction against

the defendant, who had taken upon him to make and vend these engines, notwithstanding the plaintiff had sole right and property under the letters patent.

The defendant, by his answer, insisted it was not a new invention, so as to entitle the plaintiff to an injunction.

There was no replication, but the cause came on at the Rolls, upon bill and answer, in *September* 1740, before Mr. Justice *Parker*, who, not thinking the answer sufficient, directed an action at law to be brought by the plaintiff, for a breach of the letters patent, and retained the bill for a twelvemonth; the plaintiff was nonsuited at law upon the merits; and the cause is now set down by the defendant for a dismissal of the bill, and for costs.

2 Atk. [2d ed. 1794] 286, 286-87 (Ch. 1742).

When the patentee did not seek equitable relief, the action was brought directly at law. The cause of action was trespass on the case. The action was an offspring of the criminal law, and knew no form but trial by jury. See H.G. Hanbury and D.C.M. Yardley, *English Courts of Law* 64 (5th ed. 1979) (1944). The defendant could assert defenses including invalidity and noninfringement. All issues, including damages, were for the jury.

The burden of proof was on the patentee. Since letters patent of invention were issued without examination, simply upon declaration, actions to enforce the patent began with proof of entitlement to the patent, if disputed by the defendant. The burden of proving infringement was also on the plaintiff, if infringement was disputed. The English reports show that often patent infringement actions turned on the issue of entitlement or validity, whereupon when validity was found, verdict would be rendered for infringement. For example, *Dolland's Case*, 1 Carp. P.C. 28 (C.P. 1766) 9 was an action for trespass on the case, seeking damages resulting from infringement of Dolland's 1758 patent on a telescope. The defendant asserted invalidity due to prior use. The jury verdict was for Dolland.

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*Morris v. Bramson*, 1 Carp. P.C. 30 (K.B. 1776) was an action for infringement of Morris' patent, a patent previously tried and adjudged valid and infringed in *Morris v. Else*. (*Morris v. Else* is unreported in the English Reports; the case is discussed in *Boulton v. Bull*, 2 H. Bl. at 489.) In *Morris v. Bramson* the defendant argued that an addition to an old machine was not patentable as a matter of law. The judge instructed the jury on the law, and the jury found for the

plaintiff, awarding 500 pounds in damages for infringement. 1 Carp. P.C. at 31. *Bramah v. Hardcastle*, 1 Carp. P.C. 168 (K.B. 1789), was an action in trespass on the case for infringement of letters patent for a new construct of a water closet. The defendant asserted invalidity due to prior use and lack of novelty. Lord Kenyon is reported as telling the jury "the patent was void, the invention not being new," *id.* at 171, and that they should find for the defendant. 10 The jury sustained the patent, and found infringement. The court entered judgment in accordance with the jury verdict. *Arkwright v. Nightingale*, 1 Carp. P.C. 38 (C.P. 1785), was an action for infringement of a 1775 letters patent for "machines of utility in preparing silk, cotton, flax and wool for spinning." At trial the defendant claimed that the patent was invalid because of an inadequate disclosure in the specification. At the close of the trial, Lord Loughborough provided a lengthy summary of the evidence, and concluded his charge with: "Therefore the single question is, whether you believe these five witnesses are perjured, or that they speak the truth. According as you are of the opinion, one way or the other, you will find your verdict for the plaintiff or the defendant." 1 Carp. P.C. at 53. The jury rendered a verdict for the plaintiff, that is, infringement by the defendant. *Rex v. Arkwright*, 1 Car. P.C. 53 (K.B. 1785): After the decision in *Arkwright v. Nightingale*, *supra*, a *scire facias* was filed with the High Court of Chancery to repeal the patent from the rolls, the petitioner asserting in part that the invention was not new as to use in England, and that Arkwright was not the inventor. The issue was tried to a jury in King's Bench. After the close of the evidence, the court instructed the jury:

Gentlemen, thus the case stands as to the several component parts of this machine; and if upon them you are satisfied none of them were inventions unknown at the time this patent was granted, or that they were not invented by the defendant; upon either of these points the prosecutor is entitled to your verdict.

1 Car. P.C. at 101. The jury found for the prosecutor. *Turner v. Winter*, 1 T.R. 602 (K.B. 1787), reports a ruling on a motion to set aside a jury verdict of patent infringement and grant a new trial. The court granted the motion, explaining that:

And if it appear that there is any unnecessary ambiguity affectedly introduced into the specification, or anything which tends to mislead the public, in that case the patent is void. Here it does appear to me, that there is at least such a doubt on the evidence, that I cannot say this matter has been so fully and fairly examined, as to preclude any further investigation of the subject.

1 T.R. at 605. The case was remanded for a new trial. *Administrators of Calthorp v. Waymans*, 3 Keb. 710 (K.B. 1676) was an action for infringement of a patent on an engine. The jury was instructed that English law required novelty only in England, and did not require that an importer/patentee of a device new to England be the actual inventor. The jury found for the patentee, the report of the case explaining that "it appeared in evidence to a jury at Bar, that the fashion came out of Holland, and was there used above fifty years since, but never before used in England." 3 Keb. at 710.

I again stress that actions at law were tried to a jury. With respect to letters patent for inventions, and in accordance with the Statute of Monopolies, in seventeenth- and eighteenth-century England patent infringement was tried to a jury at common law. I have come upon no exception in the cases reported during this period.

#### B. CONTINUITY IN THE UNITED STATES

The reports of English patent cases do not manifest the turmoil in preserving the jury right in England, the imprisonment of jurors before 1670, and attempts to limit the jury right in England as well as in the American colonies. Reflecting this experience, there was in the new United States a reverence for the place of the jury as, in the words of Thomas Jefferson, "the only anchor yet imagined by man, by which a government can be held to the principles of its constitution." *Parklane Hosiery Co. v. Shore*, 439 U.S. 322, 343 n.10 (1979) (Rehnquist, J.,

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dissenting) (quoting 3 *The Writings of Thomas Jefferson* 71 (Washington ed. 1861)).

The Supreme Court summarized a long history in the statement:

The trial by jury is justly dear to the American people. It has always been an object of deep interest and solicitude, and every encroachment upon it has been watched with great jealousy.

*Parsons v. Bedford*, 28 U.S. (3 Pet.) 433, 445 (1830). Justice Story made clear that the right was not limited to the precise causes of action that existed in the law courts of England. *Id.* at 446-47. See generally James Fleming, Jr., *Right to a Jury Trial in Civil Actions*, 72 Yale L.J. 655 (1963). In *Curtis v. Loether*, 415 U.S. 189 (1974) the Court wrote:

Although the thrust of the Amendment was to preserve the right to jury trial as it existed in 1791, it has long been settled that the right extends beyond the common-law forms of action recognized at that time.



415 U.S. at 193. In *Tull v. United States*, 481 U.S. 412, 417 (1987) the Court reiterated that the right to jury trial extends to causes of action created by Congress which are similar to common law forms of action. As a recent example, in *Chauffeurs, Teamsters, and Helpers Local No. 391 v. Terry*, 494 U.S. 558 (1990), the Court considered whether a suit in which an employee sought back pay, for breach of a union's duty of fair representation, carried the right to a jury trial. The Court stated:

To determine whether a particular action will resolve legal rights, we examine both the nature of the issues involved and the remedy sought. "First, we compare the statutory action to 18th-century actions brought in the courts of England prior to the merger of the courts of law and equity. Second, we examine the remedy sought and determine whether it is legal or equitable in nature." *Tull*, *supra*, at 417-18 (citations omitted). The second inquiry is the more important in our analysis. *Granfinanciera, S. A. v. Nordberg*, 492 U.S. 33, 42 (1989). 494 U.S. at 565 (footnote omitted). Observing that the cause of action of a union's duty was unknown in eighteenth-century England, the Court looked to analogous actions, including an action to set aside an arbitration award, an action of a beneficiary against a trustee, and an attorney malpractice action. *Id.* at 555-56. The Court held that the respondents were entitled to a jury trial under the Seventh Amendment, despite the equitable nature of the underlying action, since the relief sought was legal in nature. *See, e.g., Beacon Theaters, Inc. v. Westover*, 359 U.S. 500 (1959):

As this Court said in *Scott v. Neely*, 140 U.S. 106, 109-110: "In the Federal courts this [jury] right cannot be dispensed with, except by the assent of the parties entitled to it, nor can it be impaired by any blending with a claim, properly cognizable at law, of a demand for equitable relief in aid of the legal action or during its pendency."

359 U.S. at 510 (footnote omitted). *See also Atlas Roofing Co. v. Occupational Safety and Health Review Comm'n*, 430 U.S. 442 (1977).

On this history, it is jarring to come upon the majority's argument that the Seventh Amendment no longer applies because there are now "claims" in United States patents, whereas the old English patents did not have claims as we know them. The removal of the jury right is not so casually achieved:

[T]he Constitution is concerned, not with form, but with substance. All of vital significance in trial by jury is that issues of fact be submitted for determination with such instructions and guidance by the court as will afford opportunity for that consideration by the jury which was

secured by the rules governing trials at common law.

*Gasoline Prods. Co. v. Champlin Ref. Co.*, 283 U.S. 494, 498 (1931).

However, the argument about claims does bring out a point of curiosity, for the law of eighteenth-century England required specificity in "particularly describing" what was patented, and the patent grant ended with a concise summary of the subject matter, with details annexed in the specification; patent "claims," in turn, are concise summaries of the subject matter, with details annexed in the specification. Following is a portion of a representative letters patent dated March 28, 1764:

To all to whom these presents shall come, John Morris, of the town of Nottingham, hosier, sendeth greeting.--

Whereas, the King's Most Excellent Majesty, by letters patent under the Great Seal of Great Britain, bearing the date at Westminster, [gave and granted to the inventors] sole privilege . . . to make, use, exercise, and vend their invention . . . in which said letters patent is contained a proviso that if the said Thomas and John Morris, and John and William Betts, or any one of them should not *particularly describe the nature of the said invention and in what manner the same is to be performed* by an instrument, in writing under their hands and seals, or the hand

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and seal of one of them, and cause the same to be enrolled in the High Court of Chancery . . .

[The specification ending with:] Now know ye, that I, the said John Morris, in pursuance of the said proviso in the said letters patent contained, do hereby declare that the said invention of an engine or machine, on which is fixed a set of working needles, which engine or machine is fixed to a stocking-frame for the making of oilet-holes or net-work in silk, thread, cotton, or worsted, as mitts, gloves, hoods, aprons, handkerchiefs, and other goods usually manufactured upon stocking-frames by a method entirely new, is particularly described in the plans hereunto annexed.

*Morris v. Bramson*, 1 Carp. P.C. at 31-32 n.\* (emphasis added). The requirement that the inventor "particularly describe" the invention was carried into the United States Patent Act of 1790:

Sec. 2. *And be it further enacted*, That the grantee or grantees of each patent shall, at the time of granting the same, deliver to the Secretary of State a specification in writing, containing a

description, accompanied with drafts or models, and explanations and models (if the nature of the invention or discovery will admit of a model) of the thing or things, by him or them invented or discovered, and described as aforesaid, in the said patents; *which specification shall be so particular, and said models so exact, as not only to distinguish the invention* or discovery from other things before known and used, but also to enable a workman or other person skilled in the art or manufacture, whereof it is a branch, or wherewith it may be nearest connected, to make, construct, or use the same. . . .

Patent Act of 1790, ch. 7, Section 2, 1 Stat. 109, 110 (1790) (emphasis added).

This requirement was continued in all subsequent revisions, which were successively more explicit. In 1836 the Patent Act required that the inventor "particularly specify the part, improvement, or combination which he claims as his own invention." Ch. 357, Section 6, 5 Stat. 117, 119. Again revised in 1870, the statute required that the inventor "particularly point out and distinctly claim the part, improvement, or combination which he claims as his invention or discovery." Ch. 230, Section 26, 16 Stat. 198, 201. The present statute, enacted in 1952, states that "the specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." 35 U.S.C. Section 112, Para. 2. This evolution in statutory directive, requiring the inventor to be more specific as to what had been invented, did not remove the jury from trial of patent infringement cases.

The majority's other response to the Constitution is to call a patent a "statute," arguing that "statutory interpretation" is not for the jury. Designating a patent a statute in order to avoid the Seventh Amendment simply denies history and our heritage. Our judicial responsibility is to uphold the Constitution, not devise ways to circumvent it.

## IV PRECEDENT

### A. FEDERAL CIRCUIT CASES SELECTED FOR CRITICISM AND OVERRULE

The Federal Circuit early in its existence deplored the "risk of effectively denying the constitutional right spelled out in the first clause of the Seventh Amendment." *Railroad Dynamics v. Stucki*, 727 F.2d at 1515, 220 USPQ at 937-38. Many Federal Circuit decisions implemented the correct standard of trial and appellate review in patent infringement cases. The majority now expressly disapproves appellate deference to the trier of fact on the issues of fact that are determined in the course of "construing" the meaning and scope of patent claims, issues

of fact that are dispositive of the question of patent infringement. The majority singles out seven cases for specific criticism, and fatally taints the many other cases that applied the correct standard of deference to the trier of fact.

The majority explains that it overrules these cases because this court held that the interpretation of disputed technologic terms in patent claims raises jury-triable issues, or because the panel applied a deferential standard of appellate review. Majority op. at 13-14. The majority does not tell us how such cases will be tried, now that appeal includes mandatory *de novo* adjudication of what were once recognized as triable facts. Even the least cynical observer must wonder at the court's capacity for this technological overload. A glance at the subject matter of the seven expressly disapproved cases illustrates these problems.

1. *McGill, Inc. v. John Zink Co.*, 736 F.2d 666, 221 USPQ 944 (Fed. Cir.), *cert. denied*, 469 U.S. 1037 (1984).

The disputed technical term in the patent claim was "recovered liquid hydrocarbon absorbent." On McGill's view of what this term

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meant, the Zink process would infringe McGill's claim; on Zink's view, the Zink process would not infringe. There was conflicting testimony of technical experts, and the issue was submitted to the jury. On appeal the Federal Circuit made the now-excoriated statement:

If, however, the meaning of a term of art in the claims is disputed and extrinsic evidence is needed to explain the meaning, construction of the claims could be left to the jury. In the latter instance, the jury cannot be directed to the disputed meaning for the term of art.

*Id.* at 672, 221 USPQ at 948 (citations omitted). On appellate review the court considered the meaning of the claims upon the following criterion:

In the instant case, the jury's finding of infringement was predicated on construction of claim 2. To obtain a reversal, Zink must demonstrate that no reasonable juror could have interpreted the claim in the fashion that supports the infringement finding. . . . Zink must convince us that there is no set of facts, consistent with McGill's interpretation, that was supported by substantial evidence.

*Id.* The majority now holds that the meaning of "recovered liquid hydrocarbon absorbent" and the other disputed technical terms that were at issue was not a jury triable issue, and that the

Federal Circuit should have, and hereafter will, decide such questions as a matter of law.

2. *Bio-Rad Labs., Inc. v. Nicolet Instrument Corp.* , 739 F.2d 604, 222 USPQ 654 (Fed. Cir.), *cert. denied*, 469 U.S. 1038 (1984).

The patented device was an interferometer that contained an oscillating mirror that varied the lengths of two of four possible paths of split beams of reflected light, whereby the thickness of the epitaxial layer of a semiconductor was determined from the points of locally maximum constructive interference, by comparing phase differences. The jury trial lasted forty-four days. On appeal this court stated that we review to determine

whether reasonable jurors, after reviewing all the evidence, could have interpreted the claims to include the sequence of events followed by [the accused optical apparatus].

*Id.* at 613, 222 USPQ at 661 (citing *Perkin-Elmer Corp. v. Computervision Corp.* , 732 F.2d 888, 893, 221 USPQ 669, 673 (Fed. Cir.), *cert. denied* , 469 U.S. 857 [ 225 USPQ 792 ] (1984)). This court declined the losing party's request that we make a *de novo* interpretation of the claims:

We emphasize that our task is not to interpret the claims as though no trial occurred. Both parties submitted testimony in support of their interpretation before the jury. Bio-Rad's interpretation prevailed and was not overturned by the trial judge. On appeal, we consider only whether reasonable jurors could have interpreted the claim in the manner presumed.

*Id.* at 614, 222 USPQ at 661-62. This practice can no longer be followed, and the Federal Circuit shall somehow conduct these technological analyses for ourselves, as a matter of law.

3. *Palumbo v. Don-Joy Co.* , 762 F.2d 969, 226 USPQ 5 (Fed. Cir. 1985).

This case too is criticized for its holding that the findings of disputed facts of the meaning of claim terms is for the trier of fact. The appeal reached us on summary judgment. Palumbo sued Don-Joy for infringement of a patent to a patellar brace used in diagnosis and treatment of patellar subluxation (dislocation of the kneecap). In holding that summary judgment was improperly granted, this court referred to the disputed factual issues that had been raised in the depositions, as well as ambiguity in the prosecution history and the need for expert witnesses to present the viewpoint of those of skill in this art. The court stated:

If the language of a claim is not disputed, then the scope of the claim may be construed as a matter of law. But when the meaning of a term in a claim is disputed and extrinsic evidence is necessary to explain that term, then an underlying factual question arises, and construction of the claim should be left to the trier or jury under appropriate instruction.

*Id.* at 974, 226 USPQ at 8. Overruling the statement that the meaning of claim terms can raise underlying factual questions and that disputed "claim construction" should be left to the trier of jury, the majority now requires that the Federal Circuit shall make these decisions *de novo*.

4. *Moeller v. Ionetics, Inc.*, 794 F.2d 653, 229 USPQ 992 (Fed. Cir. 1986).

As I mentioned *supra*, the majority also disapproves this case, criticizing its holding that "disputes over the meaning of claim language may raise factual questions reviewed for substantial evidence or clear error as the case may be," in the majority's words. The invention was a system of selectively measuring the concentration of certain cations in the presence of other components, by interposing a membrane barrier and using specified electrodes whereby cation-specific components such as nonactin, gramicidin, and valinomycin form positively charged

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complexes with the sensing device. The disputed term claims were "electrode," "electrode body," and "disposed in said body." The technologic meaning of these terms, in this usage and this invention, decided whether the terms encompassed the accused system. On appeal this court observed that the meanings of these terms were "clearly disputed," referring to conflicting evidence, and held that the matter required trial, vacating the grant of summary judgment. It appears that this court will now decide what these terms mean as a matter of law.

5. *H.H. Robertson Co. v. United Steel Deck, Inc.*, 820 F.2d 384, 2 USPQ2d 1926 (Fed. Cir. 1987).

In connection with a motion for preliminary injunction, the dispositive issue before the district court was the meaning of "bottomless trench" in a patent for a concrete deck structure for distributing electrical wiring. The defendants argued that their structure was not "truly bottomless" because "horizontal metal sections" and a "horizontal metal strip" constituted a partial bottom. After a four-day hearing, the district court granted the preliminary injunction. In affirming, this court described its standard of review:

Claim construction is reviewed as a matter of law. However, interpretation of a claim may depend on evidentiary material about which there is a factual dispute, requiring resolution of factual issues as a basis for interpretation of the claim. In this case, there was extensive testimony on the issue of claim construction, including the conflicting views of experts on both

legal and factual questions. Those factual considerations that are pertinent to the district court's construction of the term "bottomless" are reviewed under the clearly erroneous standard.

*Id.* at 389, 2 USPQ2d at 1929 (citations omitted). The majority condemns this case for its recognition that "claim construction" may require resolution of factual issues, and the use of the clearly erroneous standard of review for those factual findings. Not only juries, but trial judges, will now be denied the deference owed to their factual findings.

6. *Perini America, Inc. v. Paper Converting Mach. Co.*, 832 F.2d 581, 4 USPQ2d 1621 (Fed. Cir. 1987).

This too was a bench trial, and had been fully tried to the court. As I mentioned *supra*, the dispute related to various aspects of machines used in manufacturing paper towels. This court recognized that these were factual issues, reviewed on the clearly erroneous standard:

A trial court's conclusions on the scope of the claims are reviewable as matters of law, but findings on disputed meanings of terms in the claims and on the infringement issue must be shown to have been clearly erroneous.

*Id.* at 584, 4 USPQ2d at 1624 (citations omitted). The court observed that "legal conclusions [are] dictated by established facts and not the other way around, and does not change the nature of the meaning-of-terms inquiry from one of fact to one of law." *Id.* The majority strongly criticizes, and overrules, these statements.

7. *Tol-O-Matic, Inc. v. Proma Produkt-Und Marketing Gesellschaft m.b.H.*, 945 F.2d 1546, 20 USPQ2d 1332 (Fed. Cir. 1991).

This was a jury trial. The technology related to rodless piston-cylinders. The invention was for a yoke structure that reduces the forces tending to widen the slit through which the external load is moved by the piston, thereby avoiding loss of cylinder pressure. At issue was the meaning of the term "to provide for lateral support of the portions of the cylinder separated by the slit and spanned by the yoke." The decision required a choice between Tol-O-Matic's position that this term meant that the yoke must prevent all widening of the slit, and Proma's position that this term required only some resistance to slit widening. At the trial there was testimony by engineers representing both sides, who ran tests on rodless cylinders under various conditions and reached inconsistent results. The jury was instructed to consider all of the evidence and find the meaning of the disputed term, and then to apply it to the accused device. On appeal this court endorsed the procedure:

The interpretation of claims is defined as a matter of law based on underlying facts.

Interpretation of the claim words "provide for lateral support" *required that the jury give consideration and weight to several underlying factual questions*, including in this case the description of the claimed element in the specification, the intended meaning and usage of the claim terms by the patentee, what transpired during the prosecution of the patent application, and the technological evidence offered by the expert witnesses. *When the meaning of a term in a patent claim is unclear, subject to varying interpretations, or ambiguous, the jury may interpret the term en route to deciding the issue of infringement*. The jury's verdict of noninfringement is reviewed, in accordance with the rules governing review of jury determinations, to ascertain whether reasonable jurors could

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have interpreted the claim in a way that supports the verdict.

*Id.* at 1549-50, 20 USPQ at 1335-36 (emphases added) (citations omitted).

This case is severely criticized for the emphasized statements. According to the majority these questions are not factual, can not be given to the jury, are not reviewed with deference to the trier of fact, and will be decided *de novo* by the Federal Circuit.

#### B. OTHER IMPUGNED FEDERAL CIRCUIT CASES

The court in *Tol-O-Matic* cited *Tillotson, Ltd. v. Walbro Corp.*, 831 F.2d 1033, 4 USPQ2d 1450 (Fed. Cir. 1987); *Tandon Corp. v. United States Int'l Trade Comm'n*, 831 F.2d 1017, 4 USPQ2d 1283 (Fed. Cir. 1987); *Howes v. Medical Components, Inc.*; *Moeller v. Ionetics, Inc.*; *Snellman v. Ricoh Co., Ltd.*, 862 F.2d 283, 8 USPQ2d 1996 (Fed. Cir. 1988), *cert. denied*, 491 U.S. 910 (1989); *Vieau v. Japax, Inc.*, 823 F.2d 1510, 3 USPQ2d 1094 (Fed. Cir. 1987); *Data Line Corp. v. Micro Technologies, Inc.*, 813 F.2d 1196, 1 USPQ2d 2052 (Fed. Cir. 1987); *Palumbo v. Don-Joy Co.*; *Bio-Rad Lab., Inc. v. Nicolet Instrument Corp.*; *Perkin-Elmer Corp. v. Computervision Corp.*; and *McGill, Inc. v. John Zink Co.*. Only some of these decisions are today singled out for criticism; but all explicitly recognized the now-rejected difference between fact and law as applied to the meaning of disputed terms in patent claims, and all deferred, on appellate review, to the findings of the trier of fact.

For example, *Data Line v. Micro Technologies* related to computer technology wherein the jury, hearing expert testimony, interpreted "means for sensing the presence or absence of output data"; this court on appeal rejected the appellant's argument that the trial court should have



"determine [d] the scope and construction of claim 1," and instead gave deferential review to the jury verdict. In *Snellman v. Ricoh* the jury verdict was reviewed on the substantial evidence standard, not *de novo*. In *Delta-X Corp. v. Baker Hughes Production Tools, Inc.*, 984 F.2d 410, 415, 25 USPQ2d 1447, 1450 (Fed. Cir. 1993), this court approved the trial procedure whereby "because of disputes over claim terms, the judge instead left resolution of these disputes to the jury."

There are many more cases than those I have listed, in which the jury decided technological and other factual disputes concerning the meaning and scope of terms of patent claims, thereby also deciding the fact of infringement, and where the jury verdict was reviewed on the usual substantial evidence/reasonable jury standard. There are many more cases than those I have listed, in which the district court at bench trial found the facts of what the claim terms mean and cover, and on appellate review this court applied the clearly erroneous standard of review. These procedures, which are in accord with factual determinations in other areas of litigation, have now been rejected. The new and unique treatment of disputed facts in patent cases does not appear to offer advantages to outweigh its disadvantages. 11

C. THE MAJORITY'S CITED AUTHORITY

The authority on which the majority relies simply does not support its statement that "the Supreme Court has repeatedly held that construction of a patent claim is a matter of law exclusively for the court." Majority op. at 15. That statement is of course correct when deciding the legal effect of a patent claim, and when stating the law to be applied by the trier of fact in interpreting disputed terms. However, it is not correct with respect to findings of disputed factual issues, issues that usually relate to the meaning and scope of the technologic terms and words of technical art that define the invention. Even the majority's selected authority recognized that such issues are factual, to be found by the jury. Although the majority now equates these factual findings with "construction of a patent," the Supreme Court did not.

In *Winans v. Denmead*, 56 U.S. (15 How.) 330 (1854) the invention was the conical shape of a coal-carrying railroad car, whereby the car could carry several times its weight in coal. The car described and claimed in Winans' patent had a circular cross-section; the accused car of Denmead had an octagonal cross-section. The trial court instructed the jury that since the patent described the circular shape, it was so limited. The Supreme Court held that the instruction was in error, and that the jury should have been instructed on the legal rule that the thing patented was not limited to the exact shape or form illustrated, but

depended on whether the same function was performed in substantially the same way and with the same result -- the rule now called the "doctrine of equivalents."

As the majority states, the Court indeed "construed" the "thing patented." 56 U.S. at 338. The "construction" was the legal rule that the claim could be infringed by an equivalent structure. Having corrected this error of law in the jury instructions, the Court did not then answer the factual question for itself, as now does the Federal Circuit. The Court remanded for retrial to the jury, on the correct instruction of law:

Whether, in point of fact, the defendant's cars did copy the plaintiff's invention, in the sense above explained, is a question for the jury, and the court below erred in not leaving that question to them upon the evidence in the case, which tended to prove the affirmative.

56 U.S. at 344.

In *Silsby v. Foote*, 55 U.S. (14 How.) 218 (1853), also relied on by the majority, the Court again did not remove factual issues from the jury. The Court construed the patent claim as a combination claim, and stated that the trial judge correctly instructed the jury on the law that all of the necessary parts of the claimed combination must be present in an infringing device. These were indeed matters of law. The Court stated that the trial judge properly left to the jury the question of which parts of the claimed device were necessary to its operation (which was to regulate the heat of a stove by automatically varying the position of the damper in response to temperature changes), as well as whether the defendants used these necessary parts.

The defendants had argued that the trial judge had impermissibly left a question of law to the jury. The Court pointed out that the question of which parts were necessary to regulate the heat of the stove was not a matter of law, but a question of fact to be decided by the jury:

The substance of the charge is, that the jury were instructed by the Judge, that the third claim in the specification was for a combination of such parts of the described mechanism as were necessary to regulate the heat of the stove; that the defendants had not infringed the patent, unless they had used all the parts embraced in the plaintiff's combination; and he left it to the jury to find what those parts were, and whether the defendants had used them.

We think this instruction was correct. The objection made to it is, that the court left to the jury what was matter of law. But an examination of this third claim, and of the defendants' prayers

for instruction, will show that the Judge left nothing but matter of fact to the jury. The construction of the claim was undoubtedly for the court. The court rightly construed it to be a claim for a combination of such of the described parts as were combined and arranged for the purpose of producing a particular effect, viz., to regulate the heat of a stove.

.... But the defendants also desired the Judge to instruct the jury that the index, the detaching process, and the pendulum, were constituent parts of this combination. How could the Judge know this as matter of law?

*Id.* at 225-26. The Court affirmed that the factual question of what the claim covered was for the jury to decide, in the course of determining the question of infringement. Indeed, the Court's query was pointed: "How could the Judge know this as a matter of law?" *Id.* at 226.

In *Coupe v. Royer*, 155 U.S. 565 (1895) the Court held that there was legal error in the trial judge's description of the invention to the jury, and in the withdrawal of the question of infringement from the jury. The Court held that the trial judge had omitted a limitation contained in the claims of the patent (viz., that the orientation of the machine was vertical). It was indeed legal error to omit a claim limitation, then as now, and the Court, correcting this error, remanded for a new trial to the jury. The Court declined to give a peremptory instruction to the jury, stating that all of the differences are "the subject of legitimate consideration by the jury": [T]he question of infringement, arising upon a comparison of the Royer patent and the machine used by the defendants, should be submitted to the jury, with proper instructions as to the nature and scope of the plaintiffs' patent as hereinbefore defined, and as to the character of the defendants' machine.

155 U.S. at 579-80. This case again illustrates the Court's role as assuring that the law is correctly stated to the jury, and the jury's role as trier of fact. Again, a case relied on by the majority does not support the majority's position.

In *Bischoff v. Wethered*, 76 U.S. (9 Wall.) 812 (1870) the Court distinguished between the construction of the patent as a legal instrument, and the factual nature of the thing invented: It is not the construction of the instrument, but the character of the thing

invented, which is sought in questions of identity and diversity of inventions.

76 U.S. at 816. The issue was identity of invention, and the Court reiterated that the meaning of disputed terms of art is "a question of fact for the jury." *Id.* at 814. The majority includes *Bischoff* as authority for its removal of these findings of fact from the jury. That is a curious reading of the holding in *Bischoff* :

A case may sometimes be so clear that the court may feel no need of an expert to explain the terms of art or the descriptions contained in the respective patents, and may, therefore, feel authorized to leave the question of identity to the jury, under such general instructions as the nature of the documents seems to require. And in such plain cases the court would probably feel authorized to set aside a verdict unsatisfactory to itself, as against the weight of the evidence. But in all such cases *the question would still be treated as a question of fact for the jury, and not as a question of law for the court* . And under this rule of practice, counsel would not have the right to require the court, as a matter of law, to pronounce upon the identity or diversity of the several inventions described in the patents produced.

*Id.* (emphasis added). Indeed, only two years later the Court again considered the issue, and in *Tucker v. Spalding* , 80 U.S. (13 Wall.) 453 (1872) the Court held that a prior patent and related expert testimony on the issue of "diversity or identity" were improperly withheld from the jury, describing the issue as a "mixed question of law and fact," and stating:

Whatever may be our personal opinions of the fitness of the jury as a tribunal to determine the diversity or identity in principle of mechanical instruments, it cannot be questioned that when the plaintiff, in the exercise of the option which the law gives him, brings his suit in the law in preference to the equity side of the court, that question must be submitted to the jury, if there is so much resemblance as raises the question at all. And though the principles by which the question must be decided may be very largely propositions of law, it still remains the essential nature of the jury trial that while the court may on this mixed question of law and fact, lay down to the jury the law which should govern them, so as to guide them to truth, and guard them against error, and may, if they disregard instructions, set aside their verdict, the ultimate response to the question must come from the jury.

80 U.S. at 455.

In *Winans v. New York and Erie R. Co.* , 62 U.S. (21 How.) 88 (1859) infringement was conceded, and the issue at trial was "originality." The Court stated that the trial judge "has given the only construction which the language of this specification will admit," *id.* at 101, in explaining to the jury that the invention was in the manner of arranging the wheels and the car

body. Having explained the invention to the jury, the question of originality was held to be for the jury, not the court.

In discussing the appropriate use of expert witnesses, the *Winans* Court stated that "professors or mechanics" can not prove "legal construction of any instrument of writing," but may testify on matters of art or science:

Experts may be examined to explain terms of art, and the state of the art, at any given time. They may explain to the court and jury the machines, models, or drawings, exhibited. They may point out the difference or identity of the mechanical devices involved in their construction. The maxim of "unique in sua arte credendum" permits them to be examined to questions of art or science peculiar to their trade or profession; but professors or mechanics cannot be received to prove to the court or jury what is the proper or legal construction of any instrument of writing.

62 U.S. at 100-01. On this aspect, too, the case does not stand for the removal of factual findings from the jury; indeed the Court recognized the various kinds of evidentiary facts on which technical experts routinely testify in patent cases.

In *Heald v. Rice*, 104 U.S. 737 (1882) the Court stated that when there was no dispute about the technology, no need for evidence, and no question of fact requiring resolution by a jury, the "mere comparison" of a reissue and original patent was a matter of law for the court. Other cases related to a directed verdict when no fact was in dispute, e.g., *Singer Mfg. Co. v. Cramer*, 192 U.S. 265 (1904) (the trial court should have granted a directed verdict when there was no dispute as to the meaning of any term of art and no substantial evidence of infringement); or the grant of a new trial, e.g., *Market St. Cable Ry. Co. v. Rowley*, 155 U.S. 621 (1895) (since the facts were not disputed and no extrinsic evidence was given or needed, the court should have instructed the jury on lack of patentable novelty; the Court remanded with directions to set aside the verdict and grant a new trial). The new trial and the directed verdict are modes of judicial management of the trial process, and quite

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different from the majority's decision simply to eliminate the jury. *Hogg v. Emerson*, 47 U.S. (6 How.) 437 (1848), another case relied on by the majority, was part of a lengthy litigation. There was a jury trial, review by a circuit panel, retrial to a jury, and two appeals to the Court. In this appeal the Court considered which documents were properly considered when "construing"

the patent, in view of the fire that destroyed the Patent Office files in 1836. In reviewing the question of whether the patent in suit covered the entire steam engine or only the improvement, the Court "construed" the patent as covering only the improvement. *Id.* at 484. The Court affirmed the trial court, which the report states "left the question of fact as to reasonable diligence of the patentee or not in this respect, and also all questions of fact involved in the points of the case for the defendants, to the jury." *Id.* at 445.

The majority also relies on *Levy v. Gadsby*, 7 U.S. (3 Cranch) 180 (1805), wherein the Court ruled that a certain document was a contract and not some other form of transaction, and was subject to the usury law. This was legal construction of a document, and was decided by the Court. This case says nothing about removing disputed factual questions from the jury. The majority also cites *Eddy v. Prudence Bonds Corp.*, 165 F.2d 157, 163 (2d Cir. 1947), *cert. denied*, 333 U.S. 485 (1948), wherein the court, reviewing the legal operation of a court-approved Supplemental Trust Agreement in bankruptcy in view of a court order, stated that "appellate courts have untrammelled power to interpret written documents." This determination of legal effect is indeed "construction" of a legal document.

I shall not dwell on the majority's reliance on other cases that were bills of equity and tried to the court, for they do not raise the issue of the jury right. See *Loom Co. v. Higgins*, 105 U.S. 580 (1881) (determining if patentee was the true inventor, and whether patent claim was sufficiently described in the specification); *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222 (1880) (limiting Goodyear's claims to dentures manufactured by vulcanization); *Bates v. Coe*, 98 U.S. 31 (1878) (determining which elements constituted the invention and which constituted equivalents); *Merrill v. Yeomans*, 94 U.S. 568 (1876) (construing patent claim in light of specification as only for process of manufacture); and *Seymour v. Osborne*, 78 U.S. (11 Wall.) 516, 546 (1871) (discussing "scientific witnesses to aid the court in coming to a correct conclusion"). The majority cites *Merrill v. Yeomans* as "applying 'well-settled rules of construing all instruments.'" The rule the Court applies at this quotation is that words and phrases are to be construed so as to give them meaning. 94 U.S. at 571. This is indeed a rule of law; the Court did not convert findings of fact into rules of law. Nor should it be necessary to point out that when cases are tried "to the court," majority op. at 21-22, the resolution of disputes as to what claim terms mean is indeed "for the court." *Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126, 52 USPQ 275 (1942), also cited by the majority, turned on prosecution history estoppel resulting from an amendment to the claims in the Patent Office. The Court stated the

rule of law that "what the patentee, by a strict construction of the claim, has disclaimed . . . cannot now be regained by recourse to the doctrine of equivalents, which at most operates, by liberal construction." There was no dispute as to the meaning of technical terms, and the Court applied this rule of law to the undisputed facts. This had been a bench trial, on bill of equity. *Ace Patents Corp. v. Exhibit Supply Co.* , 119 F.2d 349, 48 USPQ 667 (7th Cir. 1941). It is difficult to discern the relevance of this case to the issues in *Markman* .

Many dozens of patent cases reached the Supreme Court. Some of those relied on by the majority as support for trial to the court were bills in equity. Of those in law, most were tried to a jury. It is not possible to diminish the great weight of precedent wherein patent infringement was tried to a jury, the jury deciding disputed factual questions of what the patent covered, and applying these findings to the accused device. The court today effects a dramatic realignment of jury, judge, and the appellate process.

#### D. THE SPECIAL RESPONSIBILITY OF THE FEDERAL CIRCUIT

The Federal Circuit is responsible for establishing consistent national law in its areas of assigned subject matter. The court early in its existence took note that patent cases were only one of many areas of commercial dispute, only one of many areas of intellectual property dispute, that are tried in the district courts. We have striven to assure that unnecessary burdens are not placed upon the district courts of the nation by virtue of the separate path of appellate review of patent cases. We acted to assure that the same procedures would apply in the trial of patent cases as in other civil actions. See , e.g. , *Allen Organ Co. v. Kimball Int'l, Inc.* , 839 F.2d 1556, 1563, 5 USPQ2d 1769, 1774 (Fed. Cir.) (for matters not unique to patent law the procedural law of the regional circuit applies in patent trials), *cert. denied* , 488 U.S. 850 (1988). Thus the litigation process

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that served other civil disputes also served in patent litigation. Today's ruling, with its departures from the rules of evidence, its changed standards of deference and review, its conflict with established jury and bench procedures, challenges the principle on which this comity was based. Patent cases are not unique in their usage of specialized terms and words of art, in their reliance on technologic or scientific evidence, in their dependence on findings of technologic fact.

Evidentiary conflicts with respect to technology and science arise in a variety of cases; and the conflicting testimony of expert witnesses is ubiquitous. Trial judges have extensive experience in assuring a fair trial, and finding, within human limitations, the truth. 12 Today this court severs patent cases from all others, requiring different (and uncertain) procedures at trial, taking unto ourselves a different, and uncertain, appellate role.

It is the responsibility of the appellate court to assure that the law is correctly stated. The rules of patent law include an ever-enlarging body of nuance and clarification, flowing from twelve years of Federal Circuit jurisprudence and the rich history on which we have built. This court has undertaken the fine-tuning of the law, appropriate to the importance of technology in today's world. Much of this fine-tuning relates to new fields of science and technology (computers, biotechnology, materials); but it also relates to traditional concepts of patent law as applied to modern technologic and commercial needs.

The appellate role is to apply these principles in wise implementation of the policy of the law, as litigants probe the grey areas that test conflicting policy considerations. The appeal is not designed for *de novo* finding of the facts. I doubt the practical feasibility of the majority's holding that this court will "construe" the meaning of technical terms and words of art without benefit of the trial experience. It is of course appropriate for this court to be alert to methodologies of resolution of disputes that involve science and technology. The trial of scientific/technologic disputes was explored, for example, in the Report of the Carnegie Commission, *Science and Technology in Judicial Decision Making* (1993); the Report of the Brookings Institution, *Charting a Future for the Civil Jury System* (1992); and in ongoing studies and Reports of the Federal Judicial Center. However, in this complexity of problems and solutions, it is an illusion to think that patent litigation difficulties can be resolved by turning factual issues into matters of law and assigning them to the Federal Circuit.

The deference that appellate courts must give to the trial process is fundamental to the efficiency, and the effectiveness, of the judicial system. It implements the two-tier litigation right, and provides stability to the trial process while preserving appellate authority for the law, its policy and its purposes. The court's decision today denies the critical values of the trial, and moves the Federal Circuit firmly out of the juridical mainstream.

## V THE MERITS

Both sides testified on the meaning and scope of the term "inventory," as used by Markman and



in light of the Westview system. The issue was whether "inventory" meant only clothing, or could reach the invoices of the Westview system. Markman presented four witnesses. Westview presented one witness. After the jury verdict in favor of Markman the district court, applying recent Federal Circuit panel opinions that required *de novo* determination of the issue (foreshadowing today's *en banc* holding), reviewed the evidence independently and decided in favor of Westview. The district court did not discuss the jury verdict, or state whether there was evidentiary support for the jury verdict.

The district court did not apply the proper standard on post-trial motions, viz. whether there was substantial credible evidence of such quality and weight that a reasonable jury could have reached the verdict that was reached by this jury. It is for the trial judge to decide, in the first instance, whether the jury verdict can stand, or whether the judgment should have been directed, or whether a new trial should be granted. I would remand for redetermination on the correct standard.

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Footnotes

Footnote 1. The Federal Circuit, finding this fact *en banc*, holds that the inventor Markman's testimony is "of little or no probative weight" to explain his invention, apparently because he was represented by an attorney before the patent office. The majority states that it is "not unusual" for the inventor not to know what his attorney has patented. Maj. op. at 31. This will be a revelation to the nation's patentees. The majority earlier in its opinion "rejects" Markman's testimony, maj. op. at 26, apparently based on its weight, a question of fact, not on its admissibility, a ruling of law.

Footnote 2. In *Graham v. John Deere* the Court described the issue of "obviousness" in patent cases as one of law based on underlying facts. An analogous pattern has heretofore applied in connection with "claim construction", i.e., as a question of law based on underlying facts. I suggest that these ultimate questions have a strong policy component, and that the Federal

Circuit's responsibility for imparting consistency to patent decisions is a significant factor in the law/fact dichotomy.

Footnote 3. Nathan Isaacs, *The Law and the Facts*, 22 Colum. L. Rev. 1, 13 (1922) (warning courts of "medieval assumptions as to the omniscience of the learned man").

Footnote 4. English patent cases were cited by United States courts well into the nineteenth century.

Footnote 5. Attempting to understand how this procedure would work for complex technologies, at the *en banc* argument I inquired of Westview's counsel:

J. Newman: If the claim is sufficiently complex -- technologically or just complex in general -- that the judge can't decide what it means without taking testimony, hearing the experts, hearing the inventor, hearing whatever else it is that each side needs to, wants to, adduce that the judge permits . . . I can envision, can't you, that a judge would have to hold some kind of evidentiary hearing, at least, if not a mini-trial, in order to learn enough about the claim to decide, as a matter of law, disputed issues?

Mr. Griffin: Yes your honor.

J. Newman: We are assuming the issues are disputed, that this is not just a matter of explanation, but a matter of requiring a choice between one side's viewpoint and another. And that the judge should then have a preliminary trial to decide what the claim means by making whatever choices need to be made, and then tell the jury: "Take it from here now, apply this to the accused device"?

Mr. Griffin: Yes your honor.

J. Newman: That is quite unusual, is it not? Have you seen this done?

Mr. Griffin: Personally no your honor.

J. Newman: I wonder how the trial judges would take to that.

Mr. Griffin: Probably would not like it your honor, because that would impose a burden which in most cases can be avoided.

Footnote 6. Among the rare exceptions to deferential appellate review of factual findings are the "constitutional facts", discussed in *Bose Corp. v. Consumers Union of United States, Inc.*, 466 U.S. 485 (1984). In *Bose* the Court cautioned against enlarging its holding beyond the conflict between constitutional provisions there exemplified. The "constitutional fact" exemplified in *Bose* does not place all facts in the hands of appellate courts for *de novo* finding. Such exceptions to the otherwise firm rule of deference to the trier of fact have always been narrow.

See generally Frank R. Strong, *Dilemmic Aspects of the Doctrine of "Constitutional Fact"* , 47 N.C. L. Rev. 311 (1969).

Footnote 7. The date of the Statute of Monopolies is variously reported as 1623 or 1624 depending on whether the old or new English calendar is used. Edward C. Walterscheid, *The Early Evolution of the United States Patent Law: Antecedents (Part 2)* , 76 J. Pat. & Trademark Off. Soc'y 849, 873 n.98 (1994).

Footnote 8. There were two courts in Chancery, the Ordinary court and the Extraordinary court. The Extraordinary side of Chancery was so termed because matters requiring the exercise of the King's Conscience were there addressed, for extraordinary relief. Abridgment at 127; Coke, 4 Inst. at 79. The Ordinary side of Chancery has been referred to as "common-law chancery," see *Kirker v. Owings* , 98 F. 499, 506 (6th Cir. 1899), and proceeded according to the laws and statutes of England, exercising the ordinary powers of Chancery. Middle Temple, *General Abridgment of Cases in Equity* 127 (1739) ("Abridgment"); Coke, 4 Inst. at 79. The Ordinary court had the power to repeal letters patent, by plea of *scire facias*. However, if the matter "descended to issue" the court was without jurisdiction to try it to a jury, and the Chancellor would direct the issue to a court of law, where the issue would be tried to a jury, "because for that Purpose both Courts are but one." Abridgment at 128; see Coke, 4 Inst. at 80. After trial, with jury verdict rendered, the cause was returned to Chancery for further disposition consistent with the verdict. Abridgment at 130 ("A Cause shall not be examined upon Equity in the Court of Requests, Chancery, or other Court of Equity, after Judgment at the Common Law.")

Footnote 9. Carpmael lists the date of the decision as 1758, and Abbott, *supra* , at 9, states the date as 1766. The date of the patent grant is 1758, suggesting that Abbott may be correct. There is no official report of *Dolland's Case* , but the decision is discussed in *Boulton v. Bull* , 2 H. Bl. 463, 482-87 (K.B. 1795).

Footnote 10. Hanbury, *supra* , at 87-88, explains that the court was not instructing the jury on what verdict it must render. The practice was for the judge to summarize the evidence and the testimony, and frequently provide a "hint" to the jury. However, this did not diminish the authority of the jury to decide the matter.

Footnote 11. Although some *amici curiae* encouraged the Federal Circuit to find technological facts for ourselves, none explained the procedure by which we are to do so. Are we to read the entire record of the trial, re-create the demonstrations, decipher the literature of the science and art; are we to seek our own expert advice; must the parties be told the technical

training of our law clerks and staff attorneys? No *amicus* explained how improved technological correctness -- that is, truth -- would be more likely to be achieved during the appellate process of page-limited briefs and fifteen minutes per side of argument.

Footnote 12. Many aids to the trial process are at hand when the issues are scientific and technologic. The *Manual for Complex Litigation, Second* (1985) points out the utility of special verdicts and interrogatories, *see* Section 21.633, and that Fed. R. Evid. 706 is particularly useful when experts have divergent opinions, *see* Section 21.51. Important studies have been made, *see* the Federal Judicial Center's *Reference Manual of Scientific Evidence* (1994). No study that I have seen or heard of proposes simply to turn complex factual determinations of technical issues over to the appellate court. To replace the trier of fact with the Federal Circuit is as unfriendly to the search for truth, as it is unworkable.

Footnote \*. Chief Judge Archer assumed the position of Chief Judge on March 18, 1994.

Footnote †. Circuit Judge Bryson joined the Federal Circuit on October 7, 1994 and has not participated in the disposition of this appeal.

- End of Case -

In re Lowry (CA FC) 32 USPQ2d 1031

**In re Lowry**

**U.S. Court of Appeals Federal Circuit  
32 USPQ2d 1031**

**Decided August 26, 1994  
No. 93-1558**

**Headnotes**

**PATENTS**

**1. Patentability/Validity -- Anticipation -- In general (§ 115.0701)**

**Patentability/Validity -- Obviousness -- In general (§ 115.0901)**

Board of Patent Appeals and Interferences erred, in upholding rejection of claims for data

processing system under 35 USC 102(e) and 103, by analogizing data structure and computer memory of claimed system to printed matter, since board improperly extended printed matter rejection to field of information stored in memory, and since prior cases involving printed matter have no factual relevance if invention requires that information be processed by computer rather than human mind.

**2. Patentability/Validity -- Anticipation -- Prior art (§ 115.0703)**

**Patentability/Validity -- Obviousness -- Relevant prior art -- Particular inventions (§ 115.0903.03)**

Claims for data processing system are neither anticipated by, nor obvious in view of, prior patent for database management system, since claimed invention, which employs plurality of attribute data objects having both hierarchical and non-hierarchical relationships, involves organization of information and its interrelationships which reference neither discloses nor suggests.

**Case History and Disposition:**

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Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Edward S. Lowry, serial no. 07/181,105 (data processing system having a data structure with a single, simple primitive). From decision upholding rejection of claims

under 35 USC 102(e) and 103, applicant appeals. Reversed.

**Attorneys:**

Barry N. Young, Maynard, Mass., and Denis G. Maloney, Lexington, Mass., for appellant.

Lee E. Barrett, associate solicitor, Fred E. McKelvey, solicitor, and Murriel E. Crawford, associate solicitor, PTO, for appellee.

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**Judge:**

Before Skelton, senior circuit judge, and Rich and Rader, circuit judges.

**Opinion Text**

**Opinion By:**

Rader, J.

Edward S. Lowry appeals the U.S. Patent and Trademark Office Board of Patent Appeals and Interferences' rejection of all claims in Patent Application Serial No. 07/181,105. On July 30, 1993, the Board reversed the rejection of claims 1 through 5 under 35 U.S.C. Section 101 (1988). The Board also affirmed the rejection of claims 1 through 19 under 35 U.S.C. Section 103 (1988) and claims 20 through 29 under 35 U.S.C. Section 102(e) (1988). This court reverses.

**BACKGROUND**

Lowry's patent application -- "Data Processing System Having a Data Structure with a Single,

Simple Primitive" -- relates to the storage, use, and management of information residing in a memory. The PTO does not dispute the features and advantages of Lowry's claimed invention. The invention provides an efficient, flexible method of organizing stored data in a computer memory.

A memory stores data according to a particular order or arrangement. Application programs use stored data to perform specified functions. A data model provides the framework for organizing and representing information used by an application program. Data models define permissible data structures -- organizational structures imposed upon the data used by the application program -- compatible with particular data processing systems. Data structures are the physical implementation of a data model's organization of the data. Data structures are often shared by more than one application program.

The prior art contains data models and data structures. Prior art data models are generally one of two kinds: functionally expressive or structurally expressive data models. Functionally expressive data models enable complex nested operations using large blocks of data. These data models, however, are limited to a narrow class of applications and generally require more complex interfaces to functionality. Structurally expressive data models, on the other hand, define more varied data structures capable of representing accurately complex information. These data models, however, make complex nested operations on large blocks of data quite difficult.

Lowry's invention seeks to optimize both structural and functional expressiveness. Lowry discloses a data structure accessible by many different application programs. Lowry's data structure is based upon the "Attributive data model." The Attributive data model represents complex information in terms of attributes and relationships between attributes. According to Lowry's specification, "[a]n attribute expresses the idea that one thing is attributed to another thing." Thus, the Attributive data model capitalizes on the concept that a database is a collection of attributions, whereby information is represented in terms of its characteristics and relationships to other information.

In accordance with the Attributive data model, Lowry's data structure comprises a plurality of attribute data objects (ADOs) stored in memory. An ADO is a single primitive data element "compris[ing] sequences of bits which are stored in the memory as electrical (or magnetic) signals that represent information." It contains information used by the application program and information regarding its relationship with other ADOs. Lowry asserts that his data structure is



functionally expressive by virtue of its representation of information in terms of attributes. Lowry also states that "[s]tructural expressiveness is achieved by making that primitive data object extremely simple and allowing for highly unconstrained interconnections between attribute instances."

According to the claimed invention, ADOs have both hierarchical and non-hierarchical interrelationships. A few specific rules govern these relationships. Because the claimed invention uses single ADOs governed by simple organizational rules, Lowry asserts that it may flexibly and accurately represent complex objects and relationships. The hierarchical relationships form a conceptual pyramidal structure. Hierarchical correlations describe "holding" or "being held" relationships. An ADO can "hold" one or more other ADOs. Each ADO, however, can "be held" by only one other ADO. Thus, while capable of holding many others, an ADO can be held by only one other ADO. One ADO, called the apex ADO, holds at least one other ADO but is held by no other ADO. This apex ADO is the only ADO that lacks a being-held relationship. From the apex ADO, the hierarchical relationships fan out in a pyramidal structure.

ADOs also have non-hierarchical relationships. These are essentially "pointing" relationships between ADOs. There are two basic types of ADOs: (1) element data objects, which refer to only themselves, and (2) relation data objects, which refer to one other ADO, called a referent ADO. A referent

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ADO is merely an ADO that a relation data object refers to. Each ADO can be a referent ADO for more than one ADO. According to Lowry's specification, this arrangement of hierarchically and non-hierarchically related single primitive ADOs facilitates software operations such as retrieval, addition, and removal of information in the data structure.

Claims 1 through 5 claim a memory containing a stored data structure. Claim 1 is representative:

1. A memory for storing data for access by an application program being executed on a data processing system, comprising:

a data structure stored in said memory, said data structure including information resident in a database used by said application program and including:

a plurality of attribute data objects stored in said memory, each of said attribute data objects

containing different information from said database;  
a single holder attribute data object for each of said attribute data objects, each of said holder attribute data objects being one of said plurality of attribute data objects, a being-held relationship existing between each attribute data object and its holder attribute data object, and each of said attribute data objects having a being-held relationship with only a single other attribute data object, thereby establishing a hierarchy of said plurality of attribute data objects;  
a referent attribute data object for at least one of said attribute data objects, said referent attribute data object being nonhierarchically related to a holder attribute data object for the same at least one of said attribute data objects and also being one of said plurality of attribute data objects, attribute data objects for which there exist only holder attribute data objects being called element data objects, and attribute data objects for which there also exist referent attribute data objects being called relation data objects; and  
an apex data object stored in said memory and having no being-held relationship with any of said attribute data objects, however, at least one of said attribute data objects having a being-held relationship with said apex data object.

Claims 6 through 19 claim a data processing system executing an application program, containing a database, a central processing unit (CPU) means for processing the application program, and a memory means for holding the claimed data structure. Claims 20-23, 25, and 28 specify methods of accessing, creating, adding, and erasing ADOs within the data structure. Claim 24 specifies a method for creating a data structure. Claims 26, 27, and 29 claim methods of creating and erasing non-hierarchical relationships between ADOs and referent ADOs.

## **THE PROCEEDINGS BEFORE THE PATENT AND TRADEMARK OFFICE**

The examiner rejected claims 1 through 5 under 35 U.S.C. Section 101 as non-statutory subject matter. The examiner also rejected claims 1 through 19 under 35 U.S.C. Section 103 as obvious in light of U.S. Patent No. 4,774,661 (Kumpati). Finally, the examiner rejected claims 20 through 29 under 35 U.S.C. Section 102(e) as anticipated by Kumpati.

The Board reversed the 35 U.S.C. Section 101 rejection. The Board found that claims 1 through 5, directed to a memory containing stored information, as a whole, recited an article of manufacture. The Board concluded that the invention claimed in claims 1 through 5 was statutory subject matter.

When evaluating patentability under sections 102 and 103, the Board failed to give patentable

weight to the claimed data structure. The Board stated that the claims on appeal specify relationships between the ADOs stored in the memory. The Board analogized Lowry's data structure comprised of ADOs to printed matter and relied on this statement from *In re Gulack* , 703 F.2d 1381, 217 USPQ 401 (Fed. Cir. 1983):

Where the printed matter is not functionally related to the substrate, the printed matter will not distinguish the invention from the prior art in terms of patentability. Although the printed matter must be considered, in that situation it may not be entitled to patentable weight.

*Id* . at 1385.

In *Gulack* , this court concluded that "the critical question is whether there exists any new and unobvious functional relationship between the printed matter and the substrate." *Id* . at 1386 (footnote omitted). The Board therefore framed the question as whether a new, nonobvious functional relationship exists between the printed matter (data structure with ADOs) and the substrate (memory). The Board determined that Lowry did not show such a functional relationship. Thus, the Board agreed with the examiner that the data structure could not distinguish the claimed invention from the prior art. The Board held that Kumpati, disclosing a CPU using a memory and containing stored data in a data structure, rendered

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all claims either anticipated or obvious. Lowry appealed.

### DISCUSSION

This court reviews the Board's determination of obviousness *de novo*. *In re Woodruff* , 919 F.2d 1575, 1577, 16 USPQ2d 1934, 1935 (Fed. Cir. 1990). This court reviews factual findings underlying the obviousness determination for clear error. *Id* . Whether a prior art reference anticipates the claimed invention is a question of fact reviewed under the clearly erroneous standard. *In re King* , 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986).

The Patent and Trademark Office (PTO) must consider all claim limitations when determining patentability of an invention over the prior art. *Gulack* , 703 F.2d at 1385. The PTO may not disregard claim limitations comprised of printed matter. *See Gulack* , 703 F.2d at 1384; *see also Diamond v. Diehr* , 450 U.S. 175, 191 [ 209 USPQ 1 ] (1981). This court in *Gulack* , however, would not give patentable weight to printed matter absent a new and unobvious

functional relationship between the printed matter and the substrate. The Board in this case determined that Lowry's data structures were analogous to printed matter and therefore the specific features of the constituent ADOs deserved no patentable weight without a functional printed matter-substrate relationship. Finding no such functional relationship between the ADOs and the memory, the Board refused to consider the specific data structure limitations.

[1] As an initial matter, this court notes that *Gulack* cautioned against a liberal use of "printed matter rejections" under section 103:

A "printed matter rejection" under Section 103 stands on questionable legal and logical footing. Standing alone, the description of an element of the invention as printed matter tells nothing about the differences between the invention and the prior art or about whether that invention was suggested by the prior art. . . . [The Court of Customs and Patent Appeals], notably weary of reiterating this point, clearly stated that printed matter may well constitute structural limitations upon which patentability can be predicated.

*Gulack* , 703 F.2d at 1385 n.8. Despite this cautioning, the Board erroneously extended a printed matter rejection under sections 102 and 103 to a new field in this case, which involves information stored in a memory. This case, moreover, is distinguishable from the printed matter cases. The printed matter cases "dealt with claims defining as the invention certain novel arrangements of printed lines or characters, useful and intelligible only to the human mind." *In re Bernhart* , 417 F.2d 1395, 1399, 163 USPQ 611, 615 (CCPA 1969). The printed matter cases have no factual relevance where "the invention as defined by the claims *requires* that the information be processed not by the mind but by a machine, the computer." *Id* . (emphasis in original). Lowry's data structures, which according to Lowry greatly facilitate data management by data processing systems, are processed by a machine. Indeed, they are not accessible other than through sophisticated software systems. The printed matter cases have no factual relevance here.

Nor are the data structures analogous to printed matter. Lowry's ADOs do not represent merely underlying data in a database. ADOs contain both information used by application programs and information regarding their physical interrelationships within a memory. Lowry's claims dictate how application programs manage information. Thus, Lowry's claims define functional characteristics of the memory.

Contrary to the PTO's assertion, Lowry does not claim merely the information content of a memory. Lowry's data structures, while including data resident in a database, depend only

functionally on information content. While the information content affects the exact sequence of bits stored in accordance with Lowry's data structures, the claims require specific electronic structural elements which impart a physical organization on the information stored in memory. Lowry's invention manages information. As Lowry notes, the data structures provide increased computing efficiency.

Indeed, Lowry does not seek to patent the Attributive data model in the abstract. Nor does he seek to patent the content of information resident in a database. Rather, Lowry's data structures impose a physical organization on the data.

In Lowry's invention, the stored data adopt no physical "structure" *per se*. Rather, the stored data exist as a collection of bits having information about relationships between the ADOs. Yet this is the essence of electronic Structure. In *Bernhart*, this court's predecessor noted:

There is one further rationale used by both the board and the examiner, namely, that the provision of new signals to be stored by the computer does not make it a new machine, i.e. it is *structurally* the same, no matter how new, useful and unobvious the result. . . . To this question we say that if a

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machine is programmed in a certain new and unobvious way, it is physically different from the machine without that program; its memory elements are differently arranged. The fact that these physical changes are invisible to the eye should not tempt us to conclude that the machine has not been changed.

*Bernhart*, 417 F.2d at 1400 (emphasis added).

More than mere abstraction, the data structures are specific electrical or magnetic structural elements in a memory. According to Lowry, the data structures provide tangible benefits: data stored in accordance with the claimed data structures are more easily accessed, stored, and erased. Lowry further notes that, unlike prior art data structures, Lowry's data structures simultaneously represent complex data accurately and enable powerful nested operations. In short, Lowry's data structures are physical entities that provide increased efficiency in computer operation. They are not analogous to printed matter. The Board is not at liberty to ignore such limitations.

Even assuming, *arguendo*, that data objects and data structures are analogous to printed matter,

the Board erred in its reliance on *Gulack*. As part of its burden to establish a *prima facie* case of obviousness, *see In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992), the burden of establishing the absence of a novel, nonobvious functional relationship rests with the PTO. "If examination at the initial stage does not produce a *prima facie* case of unpatentability, then without more the applicant is entitled to grant of the patent." *Id.* The PTO did not establish that the ADOs, within the context of the entire claims, lack a new and nonobvious functional relationship with the memory. The ADOs follow a particular sequence that enables more efficient data processing operations on stored data. The ADOs facilitate addition, deletion, and modification of information stored in the memory. In sum, the ADO's perform a function. *Gulack* requires no more. *See Gulack*, 703 F.2d at 1386.

With the foregoing in mind, this court now turns to the specific prior art rejections. The Board rejected claims 1 through 19 under section 103 as obvious over Kumpati. The Board found that claims 20-29 were anticipated by Kumpati. Claims 1 through 19 include a memory, comprising the claimed data structure, for storing data for access by an application program. Claims 20 through 29 describe methods of performing data management operations with respect to the claimed data structure.

The Kumpati patent, entitled "Database Management System with Active Data Dictionary," discloses a database management system containing an active data dictionary that the user can access and modify. Kumpati's data dictionary contains information about the structure and usage of the data stored in the database management system.

Kumpati discloses a data model within a database management system complete with hierarchical and relational interrelationships. Kumpati further defines an "attribute" as a "function that maps an entity set or relationship set into one or more value sets." A value set, in turn, "further identifies (or defines) the entity by populating these attributes with specific items of data which define these characteristics."

[2] Kumpati does not, however, disclose Lowry's ADOs and their specific hierarchical and non-hierarchical relationships. More specifically, Kumpati does not disclose the claimed pyramidal arrangement of hierarchically arranged ADOs, complete with apex ADO. Kumpati's relationship sets are different from Lowry's relation data objects, having non-hierarchical relationships with other ADOs. Neither are Kumpati's "attributes," performing a mapping function, equivalent to Lowry's ADOs, containing information used by the application program as well as information regarding its interrelationships with other ADOs.

Lowry's claimed invention involves an organization of information and its interrelationships which Kumpati neither discloses nor suggests. Kumpati also does not render Lowry's claims obvious. The Board erred in holding otherwise. Claims 1 through 19 are, as a whole, not obvious in light of Kumpati.

Because Kumpati does not contain all limitations of claims 20 through 29, the Board erred in holding these claims anticipated by Kumpati. Therefore, this court reverses the section 102 rejection of claims 20 through 29.

### **CONCLUSION**

The Board erred by denying patentable weight to Lowry's data structure limitations. This court reverses the Board's determination that claims 1 through 19 are obvious. This court also reverses the Board's decision that claims 20 through 29 are anticipated under section 102. *REVERSED*.

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**- End of Case -**

In re Bell (CA FC) 26 USPQ2d 1529

**In re Bell**

**U.S. Court of Appeals Federal Circuit  
26 USPQ2d 1529**

**Decided April 20, 1993  
No. 92-1375**

**Headnotes**

**PATENTS**

**1. Patentability/Validity -- Obviousness -- In general (§ 115.0901)**

**Patentability/Validity -- Obviousness -- Relevant prior art -- Particular inventions  
(§ 115.0903.03)**



Established relationship in genetic code between nucleic acid and protein it encodes does not make gene prima facie obvious over its correspondent protein in same way that closely related homologs, analogs, and isomers in chemistry may create prima facie case, since there are vast number of nucleotide sequences that might code for specific protein due to "degeneracy" of genetic code; gene might be obvious over correspondent protein if latter is known amino acid sequence specified exclusively by "unique" codons, but claims in application for nucleic acid molecules containing human sequences coding for human insulin-like growth factors I and II (IGF) are not obvious in view of cited prior art disclosing amino acid sequences for IGF I and II, since cited art suggests nearly infinite number of sequences, but fails to suggest which of those are human nucleic acid sequences coding for IGF.

## **2. Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)**

Reference disclosing general method for isolating genes, in combination with prior art disclosing amino acid sequences for insulin-like growth factors I and II (IGF), does not render obvious application claims for nucleic acid molecules containing human sequences coding for human IGF I and II, since, absent some teaching or suggestion supporting combination, obviousness is not established by combining teachings of prior art to produce claimed invention, since reference in question teaches away from invention claimed in application by emphasizing importance of "unique" codons, and since reference thus cannot be held to "fairly suggest" that its teachings be combined with those of prior art, which discloses amino acid sequences lacking "unique" codons.

## **3. Patentability/Validity -- Obviousness -- In general (§ 115.0901)**

### **Patent construction -- Claims -- Process (§ 125.1309)**

Similarities between method by which applicants made claimed nucleic acid molecules, and method for isolating genes taught by prior art reference, do not render application claims obvious, since applicants claim compositions, rather than method of making them.

## Case History and Disposition:

Page 1529

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Graeme I. Bell, Leslie B. Rall and James P. Merryweather, serial no. 07/065,673 ("preproinsulin-like growth factors I and II"). From decision affirming examiner's final rejection of claims 25-46, applicants appeal. Reversed.

### Attorneys:

Robert P. Blackburn, Emeryville, Calif. (Debra A. Shetka and Thomas E. Ciotti, of Morrison & Foerster, Palo Alto, Calif., and Donald S. Chisum, of Morrison & Foerster, Seattle, Wash., on brief), for appellant.

Teddy S. Gron, associate solicitor (Fred E. McKelvey, solicitor, on brief; John W. Dew hirst, Lee E. Barrett, Richard E. Schafer, and Albin F. Drost, of counsel), for PTO.

### Judge:

Before Rich, Lourie, and Schall, circuit judges.

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## Opinion Text

### Opinion By:

Lourie, J.

Applicants Graeme I. Bell, Leslie B. Rall, and James P. Merryweather (Bell) appeal from the March 10, 1992 decision of the U.S. Patent and Trademark Office (PTO) Board of Patent Appeals and Interferences, Appeal No. 91-1124, affirming the examiner's final rejection of claims 25-46 of application Serial No. 065,673, entitled "Preproinsulin-Like Growth Factors I and II," as unpatentable on the ground of obviousness under 35 U.S.C. Section 103 (1988). Because the Board erred in concluding that the claimed nucleic acid molecules would have been obvious in light of the cited prior art, we reverse.

### BACKGROUND

The claims of the application at issue are directed to nucleic acid molecules (DNA and

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RNA)<sup>1</sup> containing human sequences <sup>2</sup> which code for human insulin-like growth factors I and II (IGF), single chain serum proteins that play a role in the mediation of somatic cell growth following the administration of growth hormones.<sup>3</sup>

The relevant prior art consists of two publications by Rinderknecht <sup>4</sup> disclosing amino acid sequences for IGF-I and -II and U.S. Patent 4,394,443 to Weissman et al., entitled "Method for Cloning Genes." Weissman describes a general method for isolating a gene for which at least a short amino acid sequence of the encoded protein is known. The method involves preparing a nucleotide probe corresponding to the known amino acid sequence and using that probe to isolate the gene of interest. It teaches that it is advantageous to design a probe based on amino acids specified by unique codons. <sup>5</sup> The Weissman patent specifically describes the isolation of a gene which codes for human histocompatibility antigen, a protein unrelated to IGF. It describes

the design of the probe employed, stating that it was based on amino acids specified by unique codons.

The examiner rejected the claims as obvious over the combined teachings of Rinderknecht and Weissman. She determined that it would have been obvious, "albeit tedious," from the teachings of Weissman to prepare probes based on the Rinderknecht amino acid sequences to obtain the claimed nucleic acid molecules. According to the examiner, "it is clear from [Weissman] that the ordinary artisan knows how to find the nucleic acid when the amino acid sequence is known" and that "the claimed sequences and hosts would have been readily determinable by and obvious to those of ordinary skill in the art at the time the invention was made."

The Board affirmed the examiner's rejection, holding that the examiner had established a *prima facie* case of obviousness for the claimed sequences "despite the lack of conventional indicia of obviousness, e.g., structural similarity between the DNA which codes for IGF-I and the amino acid sequence of the polypeptide which constitutes [sic] IGF-I." Slip op. at 6. The Board reasoned that "although a protein and its DNA are not structurally similar, they are correspondently linked via the genetic code." *Id.* at 4 n.1. In view of Weissman, the Board concluded that there was no evidence "that one skilled in the art, knowing the amino acid sequences of the desired proteins, would not have been able to predictably clone the desired

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DNA sequences without undue experimentation." *Id.* at 8.

The issue before us is whether the Board correctly determined that the amino acid sequence of a protein in conjunction with a reference indicating a general method of cloning renders the gene *prima facie* obvious.

## DISCUSSION

We review an obviousness determination by the Board *de novo*. *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). Bell argues that the PTO has not shown how the prior art references, either alone or in combination, teach or suggest the claimed invention, and thus that it has failed to establish a *prima facie* case of obviousness.

We agree. The PTO bears the burden of establishing a case of *prima facie* obviousness. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). "A *prima facie* case of

obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art." *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976).

The Board supported the examiner's view that the "correspondent link" between a gene and its encoded protein via the genetic code renders the gene obvious when the amino acid sequence is known. In effect, this amounts to a rejection based on the Rinderknecht references alone. Implicit in that conclusion is the proposition that, just as closely related homologs, analogs, and isomers in chemistry may create a *prima facie* case, see *In re Dillon*, 919 F.2d 688, 696, 16 USPQ2d 1897, 1904 (Fed. Cir. 1990) (*in banc*), *cert. denied*, 111 S. Ct. 1682 (1991), the established relationship in the genetic code between a nucleic acid and the protein it encodes also makes a gene *prima facie* obvious over its correspondent protein.

[1] We do not accept this proposition. It may be true that, knowing the structure of the protein, one can use the genetic code to hypothesize possible structures for the corresponding gene and that one thus has the potential for obtaining that gene. However, because of the degeneracy of the genetic code, there are a vast number of nucleotide sequences that might code for a specific protein. In the case of IGF, Bell has argued without contradiction that the Rinderknecht amino acid sequences could be coded for by more than  $10^{36}$  different nucleotide sequences, only a few of which are the human sequences that Bell now claims. Therefore, given the nearly infinite number of possibilities suggested by the prior art, and the failure of the cited prior art to suggest which of those possibilities is the human sequence, the claimed sequences would not have been obvious.

Bell does not claim all of the  $10^{36}$  nucleic acids that might potentially code for IGF. Neither does Bell claim all nucleic acids coding for a protein having the biological activity of IGF. Rather, Bell claims only the human nucleic acid sequences coding for IGF. Absent anything in the cited prior art suggesting which of the  $10^{36}$  possible sequences suggested by Rinderknecht corresponds to the IGF gene, the PTO has not met its burden of establishing that the prior art would have suggested the claimed sequences.

This is not to say that a gene is never rendered obvious when the amino acid sequence of its coded protein is known. Bell concedes that in a case in which a known amino acid sequence is specified exclusively by unique codons, the gene might have been obvious. Such a case is not before us. 6 Here, where Rinderknecht suggests a vast number of possible nucleic acid

sequences, we conclude that the claimed human sequences would not have been obvious.

[2] Combining Rinderknecht with Weissman does not fill the gap. Obviousness " 'cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination.' " *In re Fine*, 837 F.2d at 1075, 5 USPQ2d at 1598 (citing *ACS Hosp. Sys. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)). What a reference teaches and whether it teaches toward or away from the claimed invention are questions of fact. *See Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 960-61, 220 USPQ 592, 599-600 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 835 [ 225 USPQ 232] (1984).

While Weissman discloses a general method for isolating genes, he appears to teach away from the claimed invention by emphasizing the importance of unique codons for the amino acids. Weissman suggests that it is generally advantageous to design a probe based on an amino acid sequence specified by unique codons, and also teaches that it is "counterproductive" to use a primer having

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more than 14-16 nucleotides unless the known amino acid sequence has 4-5 amino acids coded for by unique codons. Bell, in contrast, used a probe having 23 nucleotides based on a sequence of eight amino acids, none of which were unique. Weissman therefore tends to teach away from the claimed sequences since Rinderknecht shows that IGF-I has only a single amino acid with a unique codon and IGF-II has none.

The PTO, in urging us to affirm the Board, points to the suggestion in Weissman that the disclosed method can "easily" be applied to isolate genes for an array of proteins including peptide hormones. The PTO thus argues that in view of Weissman, a gene is rendered obvious once the amino acid sequence of its translated protein is known. We decline to afford that broad a scope to the teachings of Weissman. While "a reference must be considered not only for what it expressly teaches, but also for what it fairly suggests," *In re Burckel*, 592 F.2d 1175, 1179, 201 USPQ 67, 70 (CCPA 1979), we cannot say that Weissman "fairly suggests" that its teachings should be combined with those of Rinderknecht, since it nowhere suggests how to apply its teachings to amino acid sequences without unique codons.

We conclude that the Board clearly erred in determining that Weissman teaches toward, rather

than away from, the claimed sequences. Therefore, the requisite teaching or suggestion to combine the teachings of the cited prior art references is absent, *see In re Fine*, 837 F.2d 1075, 5 USPQ2d at 1599, and the PTO has not established that the claimed sequences would have been obvious over the combination of Rinderknecht and Weissman.

[3] Finally, the PTO emphasizes the similarities between the method by which Bell made the claimed sequences and the method taught by Weissman. The PTO's focus on Bell's method is misplaced. Bell does not claim a method. Bell claims compositions, and the issue is the obviousness of the claimed compositions, not of the method by which they are made. *See In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) ("The patentability of a product does not depend on its method of production.").

### CONCLUSION

Because we conclude that the combination of prior art references does not render the claimed invention obvious, we reverse the Board's decision affirming the examiner's rejection of claims 25-46.

*REVERSED*

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#### Footnotes

Footnote 1. A basic familiarity with recombinant DNA technology is presumed. For a general discussion, *see In re O'Farrell*, 853 F.2d 894, 895-99, 7 USPQ2d 1673, 1674-77 (Fed. Cir. 1988).

Footnote 2. Interchangeably referred to as "native" sequences and "genes."

Footnote 3. Claim 25 is conceded to be representative of the claims at issue:

A composition comprising nucleic acid molecules containing a human sequence encoding insulin-like growth factor (hIGF) substantially free of nucleic acid molecules not containing said hIGF sequence, wherein said hIGF sequence is selected from the group consisting of:

(a) 5'-GGA CCG GAG ACG CUC UGC GGG GCU GAG CUG GUG GAU GCU CUU CAG

UUC GUG UGU GGA GAC AGG GGC UUU UAU UUC AAC AAG CCC ACA GGG UAU GGC UCC AGC AGU CGG AGG GCG CCU CAG ACA GGU AUC GUG GAU GAG UGC UGC UUC CGG AGC UGU GAU CUA AGG AGG CUG GAG AUG UAU UGC GCA CCC CUC AAG CCU GCC AAG UCA GCU-3 ', wherein U can also be T;

(b) 5'-GCU UAC CGC CCC AGU GAG ACC CUG UGC GGC GGG GAG CUG GU G GAC ACC CUC CAG UUC GUC UGU GGG GAC CGC GGC UUC UAC UUC AGC AGG CCC GCA AGC CGU GUG AGC CGU CGC AGC CGU GGC AUC GUU GAG GAG UGC UGU UUC CGC AGC UGU GAC CUG GCC CUC CUG GAG ACG UAC UGU GCU ACC CCC GCC AAG UCC GAG-3 ', wherein U can also be T;

(c) nucleic acid sequences complementary to (a) or (b); and

(d) fragments of (a), (b) or (c) that are at least 18 bases in length and which will selectively hybridize to human genomic DNA encoding hIGF.

The other rejected claims are apparently directed to cellular hosts transformed with the claimed nucleic acid sequences. Because their fate is dependent upon that of claim 25, neither appellant nor the Patent and Trademark Office have considered them separately and we will not do so either.

Footnote 4. Rinderknecht et al., *The Amino Acid Sequence of Human Insulin-like Growth Factor I and Its Structural Homology with Proinsulin*, 253 *The Journal of Biological Chemistry* 2769-76 (1978); Rinderknecht et al., *Primary Structure of Human Insulin-like Growth Factor II*, 89 *FEB Letters* 283-86 (May 1978).

Footnote 5. A sequence of three nucleotides, called a codon, codes for each of the twenty natural amino acids. Since there are twenty amino acids and sixty-four possible codons, most amino acids are specified by more than one codon. This is referred to as "degeneracy" in the genetic code. The term "unique" refers to an amino acid coded for by a single codon. See *Amgen Inc. v. Chugai Pharmaceutical Co.*, 927 F.2d 1200, 1207-08 n.4, 18 USPQ2d 1016, 1022 n.4 (Fed. Cir.), cert. denied, 112 S. Ct. 169 (1991).

Footnote 6. We also express no opinion concerning the reverse proposition, that knowledge of the structure of a DNA, e.g., a cDNA, might make a coded protein obvious.

- End of Case -





In re Fritch (CA FC) 23 USPQ2d 1780

**In re Fritch**

**U.S. Court of Appeals Federal Circuit  
23 USPQ2d 1780**

**Decided August 11, 1992  
No. 91-1318**

**Headnotes**

**JUDICIAL PRACTICE AND PROCEDURE**

**1. Procedure -- Judicial review -- Standard of review -- Patents (§ 410.4607.09)**

Obviousness determination is based on underlying factual inquiries concerning claimed invention and prior art, which are reviewed for clear error on appeal, but ultimate conclusion of obviousness is reviewed as matter of law.

## **PATENTS**

### **2. Patent construction -- Claims -- Broad or narrow (§ 125.1303)**

Prior art patent for grass edging and watering device cannot be held to teach that device is flexible and conformable to ground in its entirety, since base portion of device includes prominent anchoring leg which would inhibit longitudinal flexibility, and since patent's express teaching that trench is necessary to install device in harder ground shows that it is not freely conformable thereto.

### **3. Patentability/Validity -- Obviousness -- Relevant prior art -- Particular inventions (§ 115.0903.03)**

#### **Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)**

Claims for landscape edging device are not prima facie obvious in view of combined teachings of two prior patents, since primary reference does not suggest overall flexibility and landscape retention function of claimed device, and since secondary reference does not, merely by virtue of flexibility of device described therein, suggest extensive modifications which would bring primary reference into conformity with application claims.

#### **4. Patentability/Validity -- Obviousness -- Combining references (§ 115.0905)**

Mere fact that prior art may be modified to reflect features of claimed invention does not make modification, and hence claimed invention, obvious unless desirability of such modification is suggested by prior art; claimed invention cannot be used as instruction manual or "template" to piece together teachings of prior art so that claimed invention is rendered obvious.

## Case History and Disposition:

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Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of John R. Fritch (serial no. 06/838,721, landscape apparatus and method). From decision upholding rejection of application claims 1-7, 9-24, 29 and 30, applicant appeals. Reversed.

### Attorneys:

Charles L. Gholz, of Oblon, Spivak, McClelland, Maier & Neustadt, Arlington, Va. (John R. Fritch, Corpus Christi, Texas, on brief), for appellant.

Jameson Lee, associate solicitor (Fred E. McKelvey, solicitor, with him on brief; Richard E. Schafer, of counsel), for appellee.

### Judge:

Before Smith, senior circuit judge, and Plager and Rader, circuit judges.

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## Opinion Text

### Opinion By:

Smith, J.

John R. Fritch (Fritch) appeals the 27 February 1991 decision of the Patent and Trademark Office Board of Patent Appeals and Interferences (Board) affirming-in-part the Examiner's final rejection of the remaining claims in Fritch's application entitled Landscape Edging Apparatus and Method. 1 The Examiner concluded that Fritch's invention would have been obvious to one of ordinary skill in the art and was therefore unpatentable under 35 U.S.C. Section 103. The Board, except for allowing claim 28, agreed. The Board's decision is reversed.

### **Issue**

The issue is whether the Board erred in affirming the Examiner's determination that the prior art references of Wilson and Hendrix rendered

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the subject matter of Fritch's independent claims 1, 13, 24, and 29 obvious to one of ordinary skill in the art.

### **Background**

In his final rejection, the Examiner rejected claims 1-24 and 27-30 of Fritch's application as unpatentable for obviousness under 35 U.S.C. Section 103. Fritch appealed the final rejection to the Board. The Board affirmed the rejection as to claims 1-24, 29 and 30, entered a new ground of rejection for claim 27, and reversed as to claim 28. The Board agreed with the Examiner that the teachings of the Wilson and Hendrix patents rendered the subject matter of independent claims 1, 13, 24, and 29 obvious to one of ordinary skill in the art. Fritch does not appeal the Board's disposition as to claims 27 and 28, and at oral argument withdrew the appeal as to claim 8. The claims remaining in this appeal are 1-7, 9-24, 29 and 30.

### ***The Fritch Invention***

The invention claimed by Fritch involves a landscape edging device which includes a planar base portion and an upwardly extending retainer portion. The base portion is elongate, thin, flexible and has a planar bottom surface conformable to a varying slope ground surface. One longitudinal edge of the base portion serves as a mowing strip and the other serves as a retaining flange for landscape fill. The upwardly extending retainer portion is integrally connected (e.g., fused) to the base portion and defines a longitudinally extending enclosed space. The Fritch invention is intended to be used as a retainer for landscape fill in order to separate unmowable landscape fill from the mowable lawn. It may also be used to secure a landscaping sheet to the ground, or to function as guards at the base of a fence. Independent claims 1 and 13 on appeal are representative of the subject matter claimed:

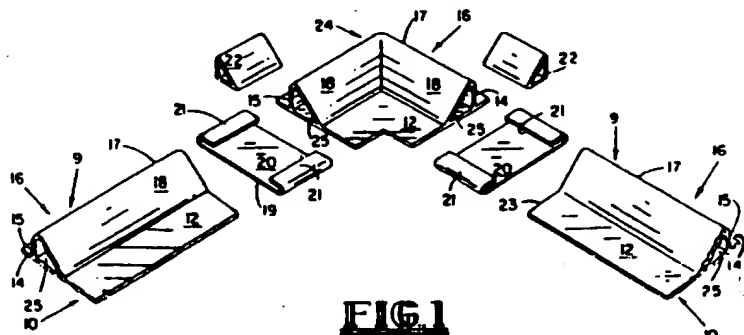
1. A landscape edging strip formed in its entirety of a thin gauge, flexible material and conformable to a ground surface of varying slope, comprising a continuous elongate, thin gauge, flexible base portion having a planar bottom surface conformable to said varying slope ground surface; a thin gauge, elongate retainer portion integral with said base portion and extending upwardly therefrom and transversely thereover to overlie a portion of said base portion; all of said retainer portion defining a longitudinally extending enclosed space; said retainer portion being integrally connected to said base portion adjacent one longitudinal edge of said base portion to define a mowing strip adjacent the other longitudinal edge of said base portion.

\* \* \* \* \*

13. A landscape edging strip formed in its entirety from thin gauge, flexible material and conformable to a ground surface of varying slope, comprising a continuous elongate, thin gauge, flexible base portion having a planar bottom surface conformable to said varying slope ground surface; a thin gauge, elongate retainer portion integral with said base portion and extending upwardly therefrom and transversely thereover to overlie a portion of said base portion; all of said retainer portion defining a longitudinally extending enclosed space; said retainer portion being integrally connected to said base portion at a transverse location between the longitudinal edges of said base portion, thereby defining a longitudinally extending retaining flange on one side of said retainer portion and a mowing strip on the other side of said retainer portion.

\* \* \* \* \* The critical language in Fritch's independent claims is that the device is to be, in

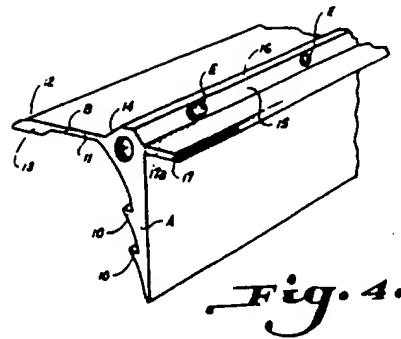
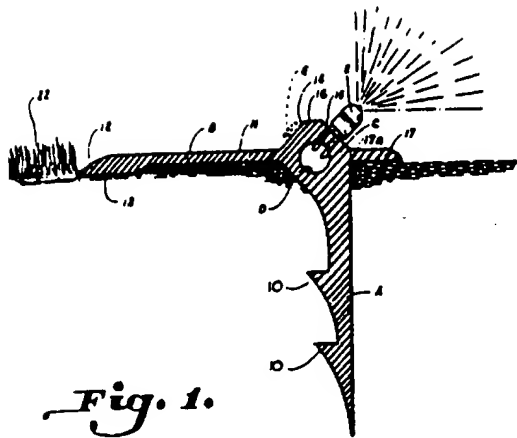
its entirety, both flexible and "conformable to a ground surface of varying slope". These limitations, although located in the claims' preambles, "are necessary to give meaning to the claim [s] and properly define the invention". 2 Figure 1 from Fritch's drawings is reproduced below:



**FIG. 1**

***The Prior Art a. The Wilson Patent***

The Wilson patent relied upon by the Examiner and the Board is entitled "Grass Edging and Watering Device". 3 The embodiment of the Wilson device includes a substantially flat mowing strip extending horizontally from a longitudinally extending body portion. Opposite the mowing strip is a scored flange which may be broken off when not needed or wanted. Between the mowing strip and the flange, and extending vertically from the body portion is an anchoring leg. Located above the anchoring leg is the body portion which contains a water conduit and sprinkler head assembly. The device is intended to be used adjacent to the borders of walks and plant beds. Figures 1 and 4 from Wilson's drawings are reproduced below:



### b. The Hendrix Patent

The Hendrix patent is entitled "Loose Material Retainer Strip". 4 The Solicitor chose not to discuss the Hendrix reference in his brief, stating that the Board had deemed Hendrix unnecessary to its decision. The Solicitor overstates the Board's position. The Board based its decision upon "a collective evaluation of the Wilson and Hendrix patents". We include Hendrix in our discussion because it did play a role in the rejection of Fritch's independent claims.

The Hendrix device is composed of elongated, flexible strips having substantially C-shaped cross-section. The bottom lip of the device is to be wider than the top lip in order to facilitate fastening the device to the ground. The device will fit most gentle contours, and the top lip will yield laterally to build-up of gravel until the gravel can be redistributed. The concave portion of the strip is installed such that it faces the material to be retained in place. Hendrix contemplates that the retainer will be used in retaining gravel in driveways, lining flower beds, or on the shoulders of asphalt or concrete highways. Figure 1 of Hendrix's drawings is reproduced below:



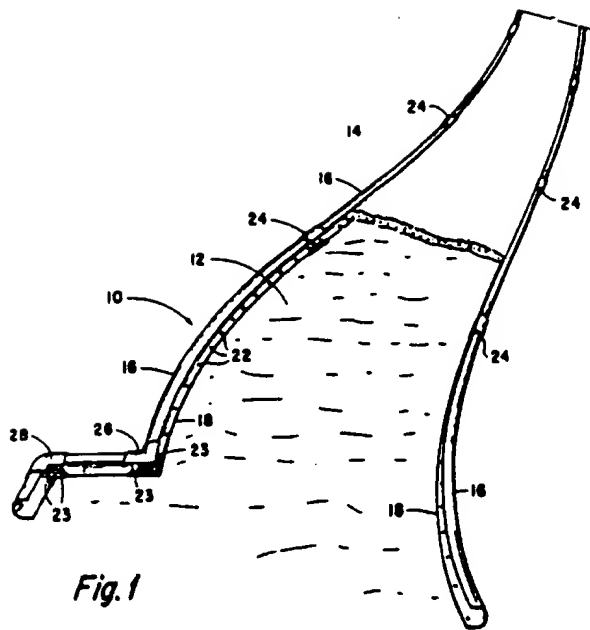


Fig. 1

### ***Standard of Review***

[1] "[O]bviousness is a question of law to be determined from the facts." 5 The obviousness determination "is based upon underlying factual inquiries concerning the claimed invention and the prior art" which are reviewed for clear error. 6 However, it is the ultimate conclusion of obviousness which the Federal Circuit reviews as a matter of law. 7

### ***Teachings of Wilson***

Fritch takes exception to the Examiner's findings of fact related to the teachings of the Wilson patent. The Examiner's rejection and the Board's opinion rely heavily on the use of Wilson in view of other references to declare the Fritch invention obvious. The Board states that it agrees with the Examiner's finding of fact regarding the teachings of Wilson. In the Examiner's answer, which the Board quotes, the Wilson device is described as follows:

Wilson discloses a landscaping edging strip comprising a relatively thin gauge, elongated flexible base portion including a mower strip B having a planar bottom surface conformable to a varying slope surface.

The Board states that the Wilson reference presents "substantial evidence that Wilson is both thin and flexible." The Board regards the Wilson device as teaching that it is flexible and conformable in its entirety. This finding demonstrates clear error.

[2] It is well settled that a prior art reference is relevant for all that it teaches to those of ordinary skill in the art. 8 The base portion of Wilson is not planar in its entirety, as the Board's opinion suggests, but also includes a prominent anchoring leg to secure the device to the ground. The anchoring leg, which runs the length of the Wilson device, would inhibit longitudinal flexibility of the Wilson device. Indeed, Wilson expressly contemplates flexibility and conformability *only* in the mower strip. Wilson states that its mower strip may be lifted in order to pack dirt thereunder for the purpose of securing the device to the ground. Fritch, on the other hand, is claimed to be flexible in its entirety.

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The Board's holding that Wilson is flexible in its entirety is based upon a misapprehension of the scope of Wilson's teachings.

Second, Wilson's anchoring leg prohibits conformability to the ground surface in the manner claimed by Fritch. The Examiner's description of Wilson as having a "planar bottom surface conformable to a varying slope surface" is applicable *only* in reference to the mower strip. This description, however, ignores the anchor leg and the fact that it must be placed *into* the ground. Wilson expressly teaches that the anchoring leg may be pushed into soft soils, but in harder terrain a trench is needed in order to place the Wilson sprinkler system. In order to install the Wilson apparatus, the ground surface must be altered to conform to the device rather than, as the Solicitor contends, that Wilson is freely conformable to the ground. Fritch, on the other hand, does not require such extensive alteration of the ground surface in order to install the device.

### ***Prima Facie Obviousness***

In proceedings before the Patent and Trademark Office, the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art. 9 "[The Examiner] can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." 10 The patent applicant may then attack the Examiner's prima facie determination as improperly made out, or the applicant may present objective evidence tending to support a conclusion of nonobviousness." 11

Fritch has attacked the Board's finding that the Examiner established that Fritch's claimed invention was prima facie obvious in view of the teachings of the prior art. The Board states that "a collective evaluation of the Wilson and the Hendrix patents would have rendered the subject matter of independent claims 1, 13, 24, and 29 obvious to one of ordinary skill." Fritch maintains that there is no teaching, suggestion, or incentive in the prior art to modify or to combine the teachings of the prior art in the manner suggested by the Examiner. We agree. [3] Wilson teaches a grass edging and watering device which includes an anchoring leg for securing the device to the ground. Wilson contemplates that a trench will need to be dug in order to allow the anchoring leg to be placed into the ground if the condition of the soil requires it. This anchoring leg prohibits flexibility and conformability over the length of Wilson. Any flexibility or conformability in Wilson, which the Board states extends to the entire device, is limited to the mower strip. It is only the mower strip that is mentioned as being flexible in order to aid installation. Hendrix has been cited for its teaching of a flexible retainer strip that is able to conform to the ground surface.

Wilson addresses the problems of arresting growth of grass between areas and watering plants without wetting sidewalks. Wilson lacks any suggestion or incentive to use its water conduit as a landscape retainer since this would arguably result in clogged sprinkler heads. 12 Wilson also teaches that its mower strip is flexible in order to allow dirt to be packed thereunder. There is no suggestion in Wilson to extend that flexibility to the entire device. Wilson also lacks any teaching or suggestion that one should remove the anchoring leg. Hendrix does not, simply by virtue of its flexible nature, suggest these extensive changes which the Board states are obvious. Neither Wilson nor Hendrix, alone or in combination, provide any incentive to combine the teachings of the prior art in the manner maintained by the Board.

[4] "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under

section 103, teachings of references can be combined *only* if there is some suggestion or incentive to do so." 13 Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested

Page 1784

the desirability of the modification. 14 Wilson and Hendrix fail to suggest any motivation for, or desirability of, the changes espoused by the Examiner and endorsed by the Board.

Here, the Examiner relied upon hindsight to arrive at the determination of obviousness. It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. 15 This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention." 16

### **Conclusion**

The decision of the Board affirming the Examiner's rejection of independent claims 1, 13, 24, and 29 of Fritch's application as unpatentable over the prior art under 35 U.S.C. Section 103 is reversed. Since dependent claims are nonobvious if the independent claims from which they depend are nonobvious, the Board's affirmance of the rejection of dependent claims 2-7, 9-12, 14-23, and 30 is also reversed. 17

**REVERSED**

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#### **Footnotes**

Footnote 1. Serial No. 06/838,721.

Footnote 2. *Perkin Elmer Corp. v. Computervision Corp.*, 732 F.2d 888, 896, 221 USPQ 669,

675 (Fed. Cir. 1984).

Footnote 3. U.S. Patent No. 3,485,449.

Footnote 4. U.S. Patent No. 4,349,596.

Footnote 5. *In re De Blauwe*, 736 F.2d 699, 703, 222 USPQ 191, 195 (Fed. Cir. 1984).

Footnote 6. *In re Kulling*, 897 F.2d 1147, 1149, 14 USPQ2d 1056, 1057 (Fed. Cir. 1990).

Footnote 7. *In re De Blauwe*, 736 F.2d at 703, 222 USPQ at 195.

Footnote 8. *Beckman Instruments Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989).

Footnote 9. *In re Piasecki*, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984).

Footnote 10. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) (citing *In re Lalu*, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1988)).

Footnote 11. *In re Heldt*, 433 F.2d 808, 811, 167 USPQ 676, 678 (CCPA 1970).

Footnote 12. This court has previously found a proposed modification inappropriate for an obviousness inquiry when the modification rendered the prior art reference inoperable for its intended purpose. *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

Footnote 13. *ACS Hosp. Systems, Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

Footnote 14. *In re Gordon*, 733 F.2d at 902, 221 USPQ at 1127.

Footnote 15. *In re Gorman*, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991). *See also Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985).

Footnote 16. *In re Fine*, 837 F.2d at 1075, 5 USPQ2d at 1600.

Footnote 17. *In re Fine*, 837 F.2d at 1076, 5 USPQ2d at 1600 (citing *Hartness Int'l, Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed. Cir. 1987)). *See also In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983) (when argued together, dependent claims stand or fall with the independent claims from which they depend).

- End of Case -



Atlantic Thermoplastics Co. Inc. v. Faytex Corp. (CA FC) 23 USPQ2d 1481

**Atlantic Thermoplastics Co. Inc. v. Faytex Corp.**

**U.S. Court of Appeals Federal Circuit  
23 USPQ2d 1481**

**Decided July 13, 1992  
No. 91-1076, -1095**

**Headnotes**

**PATENTS**

**1. Patentability/Validity -- Anticipation -- Prior sale -- In general (§ 115.0707.01)**

**JUDICIAL PRACTICE AND PROCEDURE**

**Procedure -- Judicial review -- Standard of review -- Patents (§ 410.4607.09)**

Appellate review of on-sale bar under 35 USC 102(b) proceeds as question of law, and federal district court's conclusion is thus reviewed de novo, with factual findings underlying that conclusion subject to review for clear error.

**PATENTS**

**2. Patentability/Validity -- Anticipation -- Prior sale -- "Sale" (§ 115.0707.03)**

Federal district court's conclusion that patent in suit is not invalid under 35 USC 102(b) for being on sale more than one year prior to its application date is vacated and remanded for proper on-sale analysis, since court did not provide any findings of fact or analysis for its conclusion, since conclusion does not consider several offers to sell made prior to critical date, and since lack of any findings and analysis precludes determination of whether district court properly considered those offers and applied correct legal standard.

**3. Infringement -- Literal infringement (§ 120.05)**

**Infringement -- Doctrine of equivalents -- In general (§ 120.0701)**

**Patent construction -- Claims -- Process (§ 125.1309)**

Accused process for manufacturing shoe innersoles does not infringe, either literally or under doctrine of equivalents, process claims for innersole formed of polyurethane foam with elastomeric heel insert, since claims require placement of elastomeric insert material into mold, and specification refers to such insert as "solid or cellular material," whereas accused process



introduces liquid insert into smaller mold within larger innersole mold, since liquid insert of accused process lacks elastomeric properties at time of insertion, since accused process does not use "surface tack" of material to hold insert in place as required by claims, and since use of dam or inner mold in accused process to hold insert in place is substantially different from use of surface tack to perform same function.

#### **4. Patent construction -- Claims -- Process (§ 125.1309)**

Process terms in product-by-process claims must be considered limitations for purposes of infringement analysis, since process language has been consistently interpreted by courts as defining and limiting claim to product, and since disregarding process language would conflict with basic patent doctrines requiring that every claim limitation or its equivalent be present in accused product for finding of infringement, and that accused product be compared to claims themselves rather than to embodiment of claims.

### **REMEDIES**

#### **5. Monetary -- Damages -- Patents -- Lost profits (§ 510.0507.05)**

Federal district court erred in calculating lost profits due patent infringement plaintiff, since court assumed that defendant was only other supplier of goods in question and that plaintiff would thus have made all of defendant's sales, since record shows that portion of defendant's sales were of non-infringing goods, and since case therefore does not involve two-supplier market which would justify court's assumption.

#### **Particular patents -- General and mechanical -- Shoe innersole**

4,674,204, Sullivan and Fox, shock absorbing innersole and method of preparing same, finding of infringement affirmed; finding of non-invalidity vacated and remanded.

## Case History and Disposition:

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Appeal from the U.S. District Court for the District of Massachusetts, Harrington, J.

Action by Atlantic Thermoplastics Co. Inc., James B. Sullivan, and Richard B. Fox against Faytex Corp., for patent infringement. From judgment that one of two accused products sold by defendant infringes patent in suit, parties cross-appeal. Vacated in part, affirmed in part, and remanded.

### Attorneys:

Jack R. Pirozzolo, of Willcox, Pirozzolo & McCarthy (Richard L. Binder, with him on brief), Boston, Mass., for plaintiffs.

Anthony M. Lorusso, of Lorusso & Loud, Boston (Thomas M. Saunders, Boston, with him on brief; John F. Bomster, of Alder, Pollock & Sheehan, Providence, R.I., and George A. Loud, Arlington, Va., of counsel), for defendant.

### Judge:

Before Archer, Michel, and Rader, circuit judges.

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## Opinion Text

### Opinion By:

Rader, J.

Atlantic Thermoplastics owns U.S. Patent No. 4,674,204 ( '204 patent) entitled "Shock Absorbing Innersole and Method of Preparing Same." Atlantic sued Faytex Corporation 1 for infringing the '204 patented process with innersoles manufactured by two separate processes. After a bench trial, the United States District Court for the District of Massachusetts held that Faytex infringed the '204 patent by selling innersoles manufactured by Surge, Inc. The court held, however, that Faytex did not infringe the '204 patent by selling innersoles manufactured by Sorbothane, Inc. *Atlantic Thermoplastics Co. v. Faytex Corp.* , No. 88-0210-H (D. Mass. July 27, 1990). The trial court also determined that the '204 patent is not invalid under the on-sale bar of 35 U.S.C. Section 102(b) (1988).

This court affirms the district court's infringement determination. Because we are unable to determine whether the district court applied the correct legal standards under section 102(b), this court vacates the district court's judgment as to validity and remands for findings on the on-sale issue. Because the trial court improperly determined damages, this court also remands for recalculation of lost profits, if liability is again established.

### BACKGROUND

The '204 patent contains both process claims and product-by-process claims for a shock absorbing shoe innersole. The innersole is formed in a mold having a contoured heel and arch section. Two different materials combine to make the innersole: an elastomeric material in the heel section, and a polyurethane foam. The elastomeric heel insert enhances shock absorption. The polyurethane foam forms around the heel insert and supplies the rest of the innersole.

Claim 1 of the '204 patent defines the process:

In a method of manufacturing a shock-absorbing, molded innersole for insertion in footwear,

which method comprises:

- (a) introducing an expandable, polyurethane into a mold; and
- (b) recovering from the mold an innersole which comprises a contoured heel and arch section composed of a substantially open-celled polyurethane foam material, the improvement which comprises:
  - (i) placing an elastomeric insert material into the mold, the insert material having greater shock-absorbing properties and being less resilient than the molded, open-celled polyurethane foam material, and the insert material having sufficient surface tack to remain in the placed position in the mold on the introduction of the expandable polyurethane material so as to permit the expandable polyurethane material to expand about the insert material without displacement of the insert material; and
  - (ii) recovering a molded innersole with the insert material having a tacky surface forming a part of the exposed bottom surface of the recovered innersole.

Faytex distributes half-sole innersoles, or heel cups, with an elastomeric heel insert. Two different manufacturers -- Surge Products and Sorbothane -- make Faytex's innersoles. The Surge process for making innersoles differs from the Sorbothane process. Surge first manually places a solid elastomeric insert into the heel section of the innersole mold. Surge then injects polyurethane around the solid heel insert to form the innersole. Sorbothane, on the other hand, first injects a liquid elastomeric precursor into the mold, which solidifies to form the heel insert. While the heel insert is solidifying, Sorbothane injects polyurethane into the same mold to form the rest of the innersole.

The parties agree that the Surge process infringes the '204 patent. The district court concluded that the Sorbothane process did not infringe the '204 patent. The district court read the claims to require placement of a solid elastomeric insert into the mold. This reading leaves injection of liquid elastomers outside the scope of the claims. Atlantic contests this construction.

Because Faytex does not manufacture the innersoles, Atlantic cannot charge Faytex

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with infringement of the process claims. However, claim 24 of the '204 patent states: "The molded innersole produced by the method of claim 1." Atlantic argues that Faytex, by distributing products allegedly made by the claimed process, is liable as an infringer. Faytex

cross-appeals from the award of lost profit damages for the sale of surge and Sorbothane innersoles. Faytex also appeals the district court's determination that the '204 patent is not invalid under the on-sale bar of 35 U.S.C. Section 102(b).

## DISCUSSION I. On Sale Bar

Faytex asserts that the '204 patent is invalid because the claimed invention was on sale more than one year before the filing date of the application. Faytex bears the burden of showing invalidity under section 102(b) by clear and convincing evidence. *See Build ex Inc. v. Kason Indus.*, 849 F.2d 1461, 1462-63, 7 USPQ2d 1325, 1326-27 (Fed. Cir. 1988). To prevail, Faytex had to show that Atlantic sold or offered for sale the claimed innersole before October 9, 1984. A single sale or offer to sell suffices to bar patentability. *In re Caveney*, 761 F.2d 671, 676, 226 USPQ 1, 4 (Fed. Cir. 1985). This court must determine whether the district court erred in concluding that Faytex did not meet its burden.

[1] Appellate review of an on-sale bar proceeds as a question of law. *U.S. Envtl. Prods. v. Westall*, 911 F.2d 713, 715, 15 USPQ2d 1898, 1900 (Fed. Cir. 1990). Thus, this court reviews the trial court's conclusion *de novo*, with factual findings underlying that conclusion subject to review for clear error. *Manville Sales v. Paramount Sys.*, 917 F.2d 544, 549, 16 USPQ2d 1587, 1591 (Fed. Cir. 1990); *Moleculon Research v. CBS, Inc.*, 793 F.2d 1261, 1266, 229 USPQ 805, 808 (Fed. Cir. 1986), *cert. denied*, 479 U.S. 1030 (1987).

To invoke the on-sale bar, a defendant must prove that the complete claimed invention is embodied in or obvious in view of the thing sold or offered for sale before the critical date. *UMC Elecs. Co. v. United States*, 816 F.2d 647, 656, 2 USPQ2d 1465, 1471 (Fed. Cir. 1987), *cert. denied*, 484 U.S. 1025 (1988). The on-sale bar invalidates a patent for an invention offered for sale, even though not ready for satisfactory commercial marketing. *Barmag Barmer Maschinenfabrik AG v. Murata Mach.*, 731 F.2d 831, 838, 221 USPQ 561, 567 (Fed. Cir. 1984). If a patent owner seeks to avoid the on-sale bar on the basis that a sale or offer was experimental, *UMC*, 816 F.2d at 657, a trial court must determine whether the patent owner sought the sale primarily for profit rather than as part of a testing program. To determine whether profit motivated a transaction, a court must examine the claimed features, *In re Smith*, 714 F.2d 1127, 1136, 218 USPQ 976, 984 (Fed. Cir. 1983), the offeror's objective intent, and the totality of the circumstances, *U.S. Environmental Products*, 911 F.2d at 716.

[2] Despite the many issues affecting any application of the on-sale bar rule, the district court's

sole finding in this case consists of a conclusory statement:

[Atlantic's] first offer to sell and a definite sale were made to Triangle Corporation after October 9, 1984 in January of 1985, as the invention was not commercially marketable before that time. .

*Atlantic Thermoplastics*, slip op. at 26. The district court did not provide any findings of fact or analysis for its conclusion. Moreover, the district court's finding does not consider several offers to sell before October 1984. The district court apparently assumed, incorrectly, that mere offers do not trigger the on-sale bar rule. In any event, in the absence of findings, this court cannot determine whether the trial court properly considered those offers of sale and therefore applied the correct legal standard.

After a bench trial, a trial court must put forth the findings of fact relied upon to justify its actions. Fed. R. Civ. P. 52(a). Without findings, this court has no basis to evaluate whether the district court's analysis uses the proper legal standard. *Cf. Nutrition 21 v. United States*, 930 F.2d 867, 869, 18 USPQ2d 1347, 1349 (Fed. Cir. 1991) (preliminary injunction). Because the absence of findings goes to the heart of the issue, any error cannot be harmless error. Therefore, this court vacates the district court's judgment on validity and remands for a proper on-sale analysis.

## II. Infringement

The district court determined that infringement turned on the proper interpretation of two claim limitations: "placing an elastomeric insert material into the mold" and "the insert material having sufficient surface tack to remain in the placed position on the introduction of the expandable polyurethane material." *Atlantic Thermoplastics*, slip op. at 14. According to the trial court, these limitations

describ [e] a method of manufacturing innersoles by which a solid or cellular preformed elastomeric insert material is man

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ually placed or put in the heel portion of the mold and an open-celled expandable polyurethane foam material is then injected or poured into the mold so as to expand about the solid preformed

elastomeric insert material without displacement of the insert material.

*Id.* at 15. The court further held that the claim requires that the solid insert material be held in position by the inherent "tack" of the material. The trial court specifically rejected any interpretation which allowed injection of the heel insert as a liquid into the mold.

This court interprets the '204 patent claims in light of the claim language, the specification, and the prosecution history. *Hormone Research Found. v. Genentech, Inc.*, 904 F.2d 1558, 1562, 15 USPQ2d 1039, 1042-43 (Fed. Cir. 1990), *cert. dismissed*, 111 S. Ct. 1434 (1991).

This interpretation proceeds from the vantage point of one skilled in the art. *Smithkline Diagnostics v. Helena Labs.*, 859 F.2d 878, 882, 8 USPQ2d 1468, 1471 (Fed. Cir. 1988).

The parties agree that the district court correctly determined that the Surge process includes each limitation of claim 1. Therefore, the Surge process infringes the '204 patent.

The Sorbothane process is a "two-pour" process which first injects a liquid elastomer and then a liquid polyurethane into the mold. The Sorbothane mold includes a dam which outlines the heel placement of the insert. This dam captures and confines the liquid elastomer. The dam ensures that the elastomer solidifies in place to form the heel insert. Thus, upon injection of the liquid elastomeric material, the dam -- not the tack of the elastomeric material -- holds the insert in place during introduction of polyurethane foam.

The district court found that the Sorbothane process did not literally infringe the '204 patent for two reasons. First, the injection of liquid elastomeric material did not fit within the "placing" limitation. As a liquid, the court determined that the insert lacked the elastomeric qualities specified in the claim. Second, the district court determined that the dam, rather than the tackiness, held the insert in place in the mold. Thus, according to the district court, the Sorbothane process did not satisfy the tackiness limitation of the claim.

[3] This court finds no clear error in the district court's findings that *in situ* molding of the liquid elastomeric insert material does not fit within the placing limitation. "Placing an elastomeric insert material into the mold" is a limitation in claim 1. The Sorbothane process introduces a liquid insert into a mold within the larger innersole mold. The specification repeatedly refers to the insert as a "solid or cellular material" not a liquid. Furthermore, upon introduction under the Sorbothane process, the liquid polyurethane lacks elastomeric properties. The district court's finding comports with the language used in the '204 claims. Substantial evidence from expert witnesses supports the district court's interpretation.

This court also finds no clear error in the district court's finding that the Sorbothane process does not use tackiness to hold the elastomeric insert in place during injection of the polyurethane foam.

The trial court specifically found that the "tackiness of the chemical composition has no effect on the 'Sorbothane' process, as an essential component of this process is the use of a teflon-coated mold, sprayed with mold release, designed to reduce any surface tack, thus facilitating release of the heel cup from the mold." *Atlantic Thermoplastics*, slip op. at 20. The record suggests no clear error in this finding. The teflon-coated mold and mold release of the Sorbothane process inhibit the tackiness of the solidified insert. Thus, tackiness does not hold the insert immobile during insertion and expansion of the polyurethane foam. Rather, as the district court found, the small dam in the heel section holds the elastomeric material in place during its liquid and solid states. The Sorbothane process thus does not meet the "surface tack" claim limitation.

The district court also found no infringement under the doctrine of equivalents. The trial court determined that the way the Sorbothane process performed its function was substantially different from that claimed in the '204 patent. The district court found that use of a dam to hold the insert in place is substantially different from use of tack to perform the same function. This court discerns no clear error in this finding.

This court finds no basis to reverse the district court's non-infringement finding on the Sorbothane process. Therefore, this court affirms the district court's determination that Sorbothane innersoles do not infringe claim 24 of the '204 patent.

### III. Product-by-Process Claims

In the alternative, Atlantic argues that *Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991) demands reversal of the non-infringement finding, even under the district court's present interpretation of the claims. In *Scripps Clinic*, this court stated:

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he correct reading of product-by-process claims is that they are not limited to product prepared



by the process set forth in the claims.

*Id.* at 1583. Atlantic states that the Sorbothane process results in innersoles which are indistinguishable from innersoles made by the Surge process and claimed in the '204 patent. Therefore, according to Atlantic, the Sorbothane innersoles -- though made by a different non-infringing process -- also infringe. In sum, Atlantic urges this court to ignore the process claim language in its product-by-process claim.

#### A. Supreme Court and Regional Circuit History

To construe and apply the product-by-process claim of the '204 patent, this court must examine the history of products claimed with process terms. 2 This inquiry begins with several century-old Supreme Court cases.

In *Smith v. Goodyear Dental Vulcanite Co.*, 93 U.S. 486, 493 (1877), the Supreme Court construed a patent claiming a "plate of hard rubber, or vulcanite, or its equivalent, for holding artificial teeth, or teeth and gums, substantially as described." This claim was not drafted in contemporary product-by-process terms, but instead incorporated the specification. The specification, in turn, described a process for embedding teeth in soft vulcanite which later hardened to hold the artificial teeth firmly in place. 3 The Supreme Court stated that the product could not be separated from the process by which it was made:

The invention, then, is a product or manufacture made in a defined manner. It is not a product alone separated from the process by which it is created. . . . The process detailed is thereby made as much a part of the invention as are the materials of which the product is composed.

*Smith*, 93 U.S. at 493. The Supreme Court concluded that both the process and the product of that process were patentable. *Id.* at 493, 494, 501.

A few years later, the same patent was again before the Supreme Court -- this time in an infringement context. *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222 (1880). A district court had held that a celluloid plate for artificial teeth with its differing process did not infringe the patent. The Supreme Court first quoted from its *Smith* opinion to clarify that the patent claimed both product and process. On that basis, the Supreme Court concluded:

Hence, to constitute an infringement of the patent, both the material of which the dental plate is made, or its equivalent, and the process of constructing the plate, or a process equivalent

thereto, must be employed.

*Id.* at 224. After noting that "the [celluloid] process is wholly unlike that employed in making hard rubber or vulcanite plates," *id.* at 229, the Court affirmed the district court's noninfringement decree. The Court also reasoned that the product of that process, a celluloid plate, is not "substantially the same as one made of hard rubber." *Id.*

Another Supreme Court case in this time frame illustrated the significance of claiming a product with process limitations. In *Merrill v. Yeomans*, 94 U.S. 568 (1877), the patentee of heavy hydrocarbon oils deodorized by an innovative process sued retailers. These retailers sold a product nearly identical to the patentee's oil, though deodorized by a different process. As the Supreme Court noted, if the patent claimed "a new oil," then the sellers of that product may be liable as infringers. *Id.* at 568. If, on the other hand, the patent claimed only the process, the retailers did not use that, or any other, process. *Id.*

The Court again read the process language in Merrill's specifica-

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tion as a limitation on the claims. *Id.* at 571. Merrill argued, for good reason, against this interpretation:

The counsel for appellant disclaim this latter construction, and allege that the patent covers the oil described, by whatever mode it may be produced. It is necessary to insist on this view, because it is made to appear in the case that the oils sold by defendants were produced by a process very different from that described by appellant.

*Id.* The Supreme Court noted that Merrill's counsel had to make that argument because defendants sold oil made by a different process. In discussing the process limitations, the Court said

by the well-settled rules of construing all instruments, some importance must be attached to them; and, if they are to be regarded at all, they must either refer to the process of making the oils for which the applicant is claiming a patent, *or they are intended to limit his claim for a patent for the product to that product only, when produced by treating the oils in the manner*

*before described.*

*Id.* (emphasis added). The Court concluded that Merrill claimed only a process.<sup>4</sup> Therefore, the retailers were not proper parties.

In *Cochrane v. Badische Anilin & Soda Fabrik*, 111 U.S. 293 (1884) (BASF), the Supreme Court considered an infringement case. *BASF* involved alizarine, a dye. BASF obtained Reissue Patent No. 4,321 covering the product, artificial alizarine, as produced by a bromine reaction process. The claim stated:

Artificial alizarine, produced from anthracine or its derivatives by either of the methods herein described, or by any other method which will produce a like result.

*Id.* at 296. The Supreme Court noted, "No. 4,321 furnishes no test by which to identify the product it covers, except that such product is to be the result of the process it describes." *Id.* at 305.<sup>5</sup>

Cochrane, the accused infringer, sold artificial alizarine made by a sulfuric acid reaction process. BASF sued Cochrane for infringing the 4,321 patent. The district court determined that Cochrane's product made by a sulfuric process infringed the 4,321 patent. The circuit agreed. Before the Supreme Court, BASF contended that Cochrane infringed because it made artificial alizarine "from anthracine or its derivatives *by some method*." *Id.* at 309 (emphasis added). BASF argued that Cochrane made artificial alizarine; therefore, the process did not matter. *Id.* at 310. The Supreme Court disagreed.<sup>6</sup>

Instead, the Supreme Court enunciated a rule for products claimed with process limitations:

Every patent for a product or composition of matter must identify it so that it can be recognized aside from the description of the process for making it, or else nothing can be held to infringe the patent which is not made by that process.

*Id.* at 310. Based on this standard, the Supreme Court held the claim of the 4,321 patent not infringed because the defendants had used a different process.

After stating this rule for claim construction, the Supreme Court offered an alternative "view of the case." *BASF*, 111 U.S. at 311. BASF's artificial alizarine was an "old article." *Id.* In the

words of the Supreme Court, "While a new process for producing it was patentable, the product itself could not be patented, even though it was a product made artificially for the first time." *Id.*; see also *The Wood-Paper Patent*, 90 U.S. 566, 596 (1874). In other words, a patent appli-

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cant could not obtain exclusive rights to a product in the prior art by adding a process limitation to the product claim. A new process, although eligible for a process patent, could not capture exclusive rights to a product already in the prior art. Therefore, BASF could have claimed a new process for making artificial alizarine, but it had no rights to claim the product.<sup>7</sup>

Thus, in *BASF*, the Supreme Court addressed both infringement and validity (in terms of patentability) of product claims containing process limitations. In judging infringement, the Court treated the process terms as limitations on the patentee's exclusive rights. In assessing validity in terms of patentability, the Court forbade an applicant from claiming an old product by merely adding a new process. The infringement rule focused on the process as a limitation; the other rule focused on the product with less regard for the process limits. A decision from the Patent Office, for instance, cited *BASF* twice -- once for an infringement rule and once for a patentability rule. *Ex parte Fesenmeier*, 1922 C.D. 18, 302 Off. Gaz. Pat. Office 199 (1922). In *Plummer v. Sargent*, 120 U.S. 442 (1887), the Supreme Court reviewed two patents. One claimed an improved process for bronzing or coloring iron; another claimed the product of that process. *Id.* at 443. After reviewing the prior art and descriptions of both patents, the Court stated:

[I]t may be assumed that the new article of manufacture called Tucker bronze is a product which results from the use of the process described in the patent, and not one which may be produced in any other way. So that, whatever likeness may appear between the product of the process described in the patent and the article made by the defendants, their identity is not established unless it is shown that they are made by the same process.

*Id.* at 448. After finding it "difficult, if not impossible" to discern differences between the accused product and the product claimed with process limitations, the Court concluded that "the two processes differ." *Id.* at 449. Accordingly, the Court affirmed the circuit court's noninfringement ruling. *Id.* at 450.

In *General Electric v. Wabash Appliance*, 304 U.S. 364 [ 37 USPQ 466 ] (1938), the Supreme Court considered a product claim for a filament in incandescent lamps. Under R.S. 4888 (the forerunner of the current 35 U.S.C. Section 112 (1988)), the Supreme Court determined that the claim did not adequately describe the invention. *General Elec.*, 304 U.S. at 368. In reviewing the claim, the Court considered whether the process described in the specification made the claim more definite. In that context, the Court stated:

Although in some instances a claim may validly describe a new product with some reference to the method of production, a patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced.

*General Elec.*, 304 U.S. at 373 (footnote omitted). At that point, the Court quoted from *BASF*: "nothing can be held to infringe the patent which is not made by that process." *Id.* at 373-74. Thus, the Supreme Court stated in a line of cases that the infringement inquiry for product claims with process limitations focuses on whether the accused product was made by the claimed process or its equivalent. In reviewing for infringement, the regional circuits followed the rule that the process limits a product-by-process claim. For instance, in *Hide-It Leather v. Fiber Products*, 226 F. 34 (1st Cir. 1915), the United States Court of Appeals for the First Circuit affirmed the trial court's non-infringement holding because the accused product was not made by the claimed process or its equivalent. The First Circuit stated:

It is also a well-recognized rule that, although a product has definite characteristics by which it may be identified apart from the process, still, if in a claim for the product it is not so described, but is set forth in the terms of the process, nothing can be held to infringe the claim which is not made by the process.

*Id.* at 36; see also *Paeco, Inc. v. Applied Moldings*, 562 F.2d 870, 876, 194 USPQ 353, 358 (3d Cir. 1977); *United States Gypsum Co. v. Consolidated Expanded Metal Cos.*, 130 F.2d 888, 893, 55 USPQ 247, 252 (6th Cir.), cert. denied, 317 U.S. 698 [56 USPQ 592]

(1943); *Buono v. Yankee Maid Dress Corp.*, 77 F.2d 274, 279, 26 USPQ 57, 61 (2d Cir. 1935); *Downes v. Teter-Heany Dev. Co.*, 150 F. 122, 124 (3d Cir.), *cert. denied*, 205 U.S. 543 (1907). In *Parke, Davis & Co. v. American Cyanamid Co.*, 207 F.2d 571, 572, 99 USPQ 237, 238 (6th Cir. 1953), the patentee's product claim included a process limitation: "said acid being the acid derived by autolysis of mammalian liver tissue." The Sixth Circuit determined that a synthetic folic acid process did not infringe the claimed extraction process. *Id.* Likewise, the Seventh Circuit in *National Carbon Co. v. Western Shade Cloth Co.*, 93 F.2d 94, 97 [ 35 USPQ 404] (7th Cir. 1937), *cert. denied*, 304 U.S. 570 [37 USPQ 844] (1938), stated: "It has been said that a claim for a product produced by any process which will produce a like result covers the product only when made by equivalent processes." Indeed sister circuits that examined the standard for infringement of product-by-process claims uniformly followed the Supreme Court's lead.

Commentators have generally read this line of cases to mean that, in infringement proceedings, the process in a product-by-process claim serves as a limitation. In his treatise, Donald Chisum states:

A "product-by-process" claim is one in which the product is defined at least in part in terms of the method or process by which it is made. Most decisions hold that such a claim is infringed only by a product made through a substantially identical process. . . .

2 D. Chisum, *Patents* Section 8.05 (1991) (footnotes omitted). 8 *Lipscomb's Walker on Patents* states:

A claim to a product by a specific process is not infringed by the same product made by a different process.

3 E. Lipscomb III, *Lipscomb's Walker on Patents* Section 11:19 (3d ed. 1985). Another legal text states:

Product-by-process claims are usually deemed infringed only by a product made by the same process.

1 Iver P. Cooper, *Biotechnology and the Law* Section 5B.05 [2] (1991). Finally, one treatise concludes:

There is considerable case authority supporting th[e] position [that product-by-process claims cover only products made by the process specified in the claim] including a nineteenth century Supreme Court decision. [This precedent represents] a hundred years of prior law. . . .

2 Martin J. Adelman et al., *Patent Law Perspectives* Section 2.6 [10] (2d ed. 1991). These commentators discerned a rule treating process terms as limitations on product-by-process claims in infringement actions.

B. PTO and Court of Customs and Patent Appeals (CCPA)

The CCPA consistently stated the general rule that an applicant must claim an article of manufacture by its structural characteristics, not by reference to its manufacturing process. For instance, the court stated:

This court has repeatedly held that a claim for an article capable of such definition must define the article by its structure and not by the process of making it.

*In re Johnson*, 394 F.2d 591, 594, 157 USPQ 620, 623 (CCPA 1968); *In re Lifton*, 189 F.2d 261, 89 USPQ 641 (CCPA 1951); *In re McKee*, 95 F.2d 264, 266, 37 USPQ 209, 210 (CCPA 1938). Thus, the Patent and Trademark Office's Manual of Patent Examining Procedure (MPEP) still refers to product-by-process claims as "peculiar" in comparison to products "claimed in the conventional fashion." MPEP 706.03(e) (5th ed. 1983, rev. 1989). Recognizing this rule, the CCPA contrasted product-by-process claims with "true product claims." *In re Hughes*, 496 F.2d 1216, 1219, 182 USPQ 106, 108 (CCPA 1974).

As early as 1891, the Patent Office -- though recognizing the general rule -- acknowledged the need for an exception:

It requires no argument to establish the proposition that *as a rule* a claim for an article of manufacture should not be defined by the process of producing that article. . . . When the case arises that an article of manufacture is a new thing, a useful thing, and embodies invention, and that article cannot be properly defined and discriminated from the prior art otherwise than by

reference to the process of producing it, a case is presented which constitutes a proper exception to the rule.

*In re Painter*, 57 Off. Gaz. Pat. Office 999 (1891) (emphasis in original).

For years, the PTO, with the approval of the CCPA, limited this exception to those instances where the applicant could describe an invention in no way other than in terms of

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its manufacturing process. *See, e.g., In re Bridgeford*, 357 F.2d 679, 149 USPQ 55 (CCPA 1966); *In re Moeller*, 117 F.2d 565, 567, 48 USPQ 542 (CCPA 1941); *Fesenmeier*, 302 Off. Gaz. Pat. Office 199. The CCPA also recognized further reasons for the product-by-process exception:

[T]he right to a patent on an invention is not to be denied because of the limitations of the English language. . . . [T]he limitations of known technology concerning the subject matter sought to be patented should not arbitrarily defeat the right to a patent on an invention.

*Bridgeford*, 357 F.2d at 682. Thus, where applicants could not adequately describe their inventions in terms of structural characteristics, whether due to language lagging behind innovations or existing technology lagging behind in the ability to determine those characteristics, the court permitted product-by-process claiming.<sup>9</sup>

Circuit Judge Learned Hand explained that this exception protected inventors' exclusive rights to their inventions to the degree that they were able to define their innovation:

[I]t might be possible to patent a product merely as the product of a machine or process. . . . While it would in that case not be infringed by anything but the product of the machine or of the process, it might be an important protection. . . .

*Buono*, 77 F.2d at 279. In particular, Judge Learned Hand foresaw important product-by-process protections against infringement "if the machine or the process was used in another country and the product imported." *Id.* As noted, however, this claim format remained an exception to the general rule.

As product-by-process claiming became more common, the CCPA moved toward accepting product-by-process without a showing of necessity. In 1969, the court reversed a Board of



Appeal's decision holding a product-by-process claim improper because the applicant could claim the invention without relying on the process. *In re Pilkington*, 411 F.2d 1345, 162 USPQ 145 (CCPA 1969). The court instead determined that the applicant had adequately described the invention in accordance with the requirements of section 112. *Id.* Thus, the court shifted the emphasis away from the necessity for product-by-process claiming and toward determining whether the claim adequately defines the invention. *Bridgeford*, 357 F.2d at 682-83.

In *Hughes*, the CCPA permitted product-by-process claims even though the applicant could describe the invention in structural terms. *Hughes*, 496 F.2d at 1219. The court regarded "true product claims" as broader in scope than product-by-process claims -- a distinction which acknowledges the process as limiting the scope of the claim. Therefore, an applicant could claim a product in product-by-process terms as a hedge against the possibility that those broader product claims might be invalidated. *Id.* The court, however, continued to regard product-by-process claims as an exception to the general rule. *Id.* at 1218.

The overall effect of these cases made the product-by-process exception more available to applicants. The CCPA began to handle an increasing number of cases where applicants sought exclusive rights to an old or obvious product claimed by reference to a new process for its manufacture. See, e.g., *In re Avery*, 518 F.2d 1228, 186 USPQ 161 (CCPA 1975); *In re Fessman*, 489 F.2d 742, 180 USPQ 324 (CCPA 1974); *In re Brown*, 459 F.2d 531, 173 USPQ 685 (CCPA 1972). The court uniformly followed the Supreme Court's rule. An applicant could obtain a process patent for a new, useful, and nonobvious process, but could not claim rights to a product already in the prior art by merely adding a process limitation.

As the PTO confronted more product-by-process claims, it encountered a daunting administrative task. In weighing patentability, the PTO lacked facilities to replicate processes and compare the resultant product with prior art. The CCPA recognized this difficulty:

As a practical matter, the Patent Office is not equipped to manufacture products by

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the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith.

*Brown*, 459 F.2d at 535. 10 The PTO's administrative difficulty presented another reason that

the CCPA continued to regard product-by-process claims as exceptions to the general rule. *Hughes*, 496 F.2d at 1218.

In assessing patentability, however, the PTO necessarily concentrated on discerning what product or products might result from the processes in the claim. To prevent an applicant from obtaining exclusive rights to an old product by merely claiming a new process, the PTO needed a practical administrative tool. This stress on the product was appropriate because "the invention so defined is a *product* and not a *process*." *Bridgeford*, 357 F.2d at 682 (emphasis in original). This point of emphasis, however, did not deny that the process language in the claim was a defining limit of the product claim. Rather, the process limitation defined a product, not a process. Indeed, the court in *Bridgeford* called the process a claim limitation. *See also Brown*, 459 F.2d at 535; *Hughes*, 496 F.2d at 1218.

The CCPA, even in reviewing only for patentability, treated the claimed process as a limitation. In *Hughes*, for instance, the court clarified that the process defines and limits the scope of the claim. *Hughes*, 496 F.2d at 1218-19 (product claim was of a broader scope than product-by-process claims). In fact, if the process limitations of a product-by-process claim did not adequately define the invention, an applicant would fail to satisfy section 112. *See id.*; *Brown*, 459 F.2d at 535. In other words, the process is a defining limit. The CCPA also explicitly acknowledged that the process operates as a limitation in infringement actions. In *Bridgeford*, the court stated:

The policy of the Patent Office in permitting product-by-process type claims . . . has developed with full cognizance of the fact that in infringement suits some courts have construed such claims as covering only a product made by the particular *process*. . . .

357 F.2d at 682 n.5 (emphasis in original); *see also In re Hirao*, 535 F.2d 67, 69 n.3, 190 USPQ 15, 17 n.3 (CCPA 1976). In *Moeller*, the court stated:

We think the rule is well established that where one has produced an article in which invention rests over prior art articles, and where it is not possible to define the characteristics which make it inventive except by referring to the process by which the article is made, he is permitted to so claim his article, but is limited in his protection to articles produced by his method referred to in the claims.

117 F.2d at 568.

In sum, the PTO and the CCPA acknowledged product-by-process claims as an exception to the general rule requiring claims to define products in terms of structural characteristics. This exception, however, permitted an applicant to claim a product in process terms, not to acquire exclusive rights to a product already in the prior art. Though using only process terms, a product-by-process applicant sought rights to a product, not a process. Therefore, the applicant had to show that no prior art product anticipated or rendered obvious the product defined in process terms.

[4] The PTO and the CCPA did not reason that the process was not a defining limit of the product. To the contrary, the process was the only way to define and limit -- in sum, to claim -- the product. *Hughes*, 496 F.2d at 1218. Thus, in both patentability actions before the CCPA and infringement actions before the Supreme Court or the regional circuits, the courts regarded the process language in product-by-process claims as limiting the claim. Indeed by definition in most cases, the product could not be claimed in any other terms.

This court, in its initial consideration of a product-by-process claim for patentability, acknowledged that process claim limitations define the product:

Product-by-process claims are not specifically discussed in the patent statute. The practice and governing law have developed in response to the need to enable an applicant to claim an otherwise patentable product that resists definition by other than the process by which it is made. For this reason, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself.

*In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985).

The entire history of product-by-process claims suggests a ready explanation for the apparent difference of view about treatment of those claims during *ex parte* administrative proceedings and during litigation. This

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court already distinguishes treatment of claims for patentability before the PTO from treatment of claims for validity before the courts. *In re Zletz*, 893 F.2d 319, 321 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). This court permits the PTO to give claims their broadest reasonable meaning

when determining patentability. *Id.*; see also *J.P. Stevens & Co. v. Lex Tex Ltd.*, 747 F.2d 1553, 1566, 223 USPQ 1089, 1098 (Fed. Cir. 1984), *cert. denied*, 474 U.S. 822 (1985). During litigation determining validity or infringement, however, this approach is inapplicable. *Zletz*, 893 F.2d at 321; *DeGeorge v. Bernier*, 768 F.2d 1318, 1322 n.2, 226 USPQ 758, 761 n.2 (Fed. Cir. 1985). Rather the courts must consult the specification, prosecution history, prior art, and other claims to determine the proper construction of the claim language. See, e.g., *Tandon Corp. v. United States Int'l Trade Comm'n*, 831 F.2d 1017, 1021, 4 USPQ2d 1283, 1286, 5 Fed. Cir. (T) 129 (1987). Thus, accommodating the demands of the administrative process and recognizing the capabilities of the trial courts, this court treats claims differently for patentability as opposed to validity and infringement. The PTO's treatment of product-by-process claims as a product claim for patentability is consistent with policies giving claims their broadest reasonable interpretation. The same rule, however, does not apply in validity and infringement litigation. In any event, claims mean the same for infringement and validity. See, e.g., *Senmed, Inc. v. Richard-Allan Medical Indus.*, 888 F.2d 815, 818 n.7, 12 USPQ2d 1508, 1511 n.7 (Fed. Cir. 1989); *Kimberly-Clark Corp. v. Johnson & Johnson*, 745 F.2d 1437, 223 USPQ 603 (Fed. Cir. 1984).

Moreover, accepting Atlantic's invitation to ignore the process limitations in the '204 patent's product-by-process claims would require this court to disregard several other mainstay patent doctrines. For instance, Atlantic in effect invites this court to discount the significance of excluding claim limitations from infringement analysis. See, e.g., *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405, 419 (1908) (" [T]he claims measure the invention."). This court has repeatedly stated that infringement requires the presence of every claim limitation or its equivalent. See *Pennwalt Corp. v. Durand-Wayland, Inc.*, 833 F.2d 931, 935, 4 USPQ2d 1737, 1739-40 (Fed. Cir. 1987) (in banc), *cert. denied*, 485 U.S. 961, *cert. denied*, 485 U.S. 1009 (1988); *Perkin-Elmer Corp. v. Westinghouse Elec.*, 822 F.2d 1528, 1533, 3 USPQ2d 1321, 1325 (Fed. Cir. 1987); *Lemelson v. United States*, 752 F.2d 1538, 1551, 224 USPQ 526, 533 (Fed. Cir. 1985). An accused infringer can avoid infringement by showing that the accused device lacks even a single claim limitation. See, e.g., *Corning Glass Works v. Sumitomo Elec. U.S.A.*, 868 F.2d 1251, 1259, 9 USPQ2d 1962, 1968 (Fed. Cir. 1989). Thus, ignoring the claim limits of a product-by-process claim would clash directly with basic patent principles enunciated by the Supreme Court and this court.

In addition, Atlantic's invitation to disregard the claim limitations also would require this court

to determine infringement by comparing an accused product with an embodiment of the claims, not the claims themselves. This court has repeatedly emphasized that infringement analysis compares the accused product with the patent claims, not an embodiment of the claims. *See, e.g., Data scope Corp. v. SMEC, Inc.* , 879 F.2d 820, 824, 11 USPQ2d 1321, 1323 (Fed. Cir. 1989); *SRI Int'l* , 775 F.2d at 1121; *Intervet Am. v. Kee-Vet Labs.* , 887 F.2d 1050, 1055, 12 USPQ2d 1474, 1478 (Fed. Cir. 1989). Thus, Atlantic's invitation would require this court to directly ignore basic patent principles.

In light of Supreme Court caselaw and the history of product-by-process claims, this court acknowledges that infringement analysis proceeds with reference to the patent claims. Thus, process terms in product-by-process claims serve as limitations in determining infringement. In so holding, this court acknowledges that it has in effect recognized another reason to regard product-by-process claims as exceptional. This court recognizes that product-by-process claims will receive different treatment for administrative patentability determinations than for judicial infringement determinations. This difference originated with the Supreme Court's *BASF* rules -- a difference this court endorsed as recently as 1985. *See Thorpe*, 777 F.2d at 697.

This court, therefore, rejects Atlantic's invitation to ignore the process limitations in its product-by-process claims. This court's infringement rules do not require reversal of the district court's non-infringement finding regarding the Sorbothane process. Neither does this court disturb the PTO's present practice for assessing patentability of product-by-process claims.

#### **IV. Lost Profits**

The district court determined that Faytex's sale of Surge innersoles did not constitute willful infringement of the patent. The court thus declined to award enhanced damages. The court assessed damages at \$68,000 based on a lost profits valuation.

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[5] The district court erred in calculating lost profits. While a market share approach may be appropriate here, the district court did not properly apply this approach. It merely assumed that Faytex was the only other supplier of innersoles and that Atlantic would have made all of Faytex' sales. However, the district court also held, and this court agrees, that Sorbothane innersoles did

not infringe. Faytex also sold non-infringing Sorbothane innersoles. Atlantic is not entitled to lost profits on Faytex's sales of Sorbothane innersoles. Moreover the record contains no evidence that Atlantic would have made both Surge and Sorbothane sales.

Thus, this case does not involve a two-supplier market which would justify the assumption that the patent owner would have made all the infringer's sales. *See State Indus. v. Mor-Flo Indus.*, 883 F.2d 1573, 1578, 12 USPQ2d 1026, 1029 (Fed. Cir. 1989), *cert. denied*, 493 U.S. 1022 (1990). The district court, on remand, will recalculate appropriate damages using a permissible market share approach, assuming market share analysis is appropriate, if the patent is determined to be valid.

## COSTS

As a sanction for casting unsupported and unsupportable allegations that Atlantic filed a frivolous appeal, this court charges costs to Faytex.

*VACATED-IN-PART, AFFIRMED-IN-PART, AND REMANDED*

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### Footnotes

Footnote 1. Faytex makes numerous requests for sanctions under Fed. Cir. R. 38 and under 35 U.S.C. Section 285 (1988). Section 285 does not permit sanctions except in exceptional cases. Faytex is the accused infringer and thus, cannot accuse Atlantic of willful infringement. Faytex does not allege that Atlantic brought or conducted its suit in bad faith. In any event, this court does not consider Atlantic's appeal frivolous. Faytex's sanction requests lack merit. Unfounded requests for sanctions are themselves frivolous and sanctionable.

Footnote 2. This court in *Scripps Clinic* ruled without reference to the Supreme Court's previous cases involving product claims with process limitations. In the absence of responsive briefing of the issues by the *Scripps Clinic* parties, this court noted that it was reviewing an "undeveloped record," and devoted one paragraph to resolving the jurisdictional issue and one paragraph to the merits. *Scripps Clinic & Research Found. v. Genentech, Inc.*, 927 F.2d 1565,

1583-84, 18 USPQ2d 1001, 1015 (Fed. Cir. 1991). A decision that fails to consider Supreme Court precedent does not control if the court determines that the prior panel would have reached a different conclusion if it had considered controlling precedent. *See Tucker v. Phyfer*, 819 F.2d 1030, 1035 n.7 (11th Cir. 1987). For the reasons set forth below, we necessarily so conclude.

Footnote 3. Incorporation of the specification into the claim is contrary to current claim practice. *See, e.g., SRI Int'l v. Matsushita Elec.*, 775 F.2d 1107, 1121, 227 USPQ 577, 585 (Fed. Cir. 1985) (in banc). Under the old practice for claims with the phrase "substantially as described," the Supreme Court treated the specification as part of the claim. Thus, the specification added process limitations to the claimed product. *Smith v. Goodyear Dental Vulcanite Co.*, 93 U.S. 486, 494 (1877) ("If, then, the claim be read, as it should be, in connection with the preceding part of the specification, and construed in the light of the explanation which that gives, the invention claimed and patented is [the dental plate produced by the vulcanization process].").

Footnote 4. This case suggests, however, that product-by-process claims may serve to bring retailers within the scope of an infringement action. Indeed in the case at bar, Atlantic Thermoplastics has sued Faytex, a retailer, under the product-by-process claims of the '204 patent.

Footnote 5. The court construed the seemingly broad language "by any other method *which will produce a like result*" as being limited to "any process substantially the same" as the two methods described in the specification (presumably the cause of the underlined phrase). *Cochrane v. Badische Anilin & Soda Fabrik*, 111 U.S. 293, 296, 305-06 (1884) (emphasis added) (BASF).

Footnote 6. In reversing, the Supreme Court observed that Cochrane sold "alizarine . . . which was not made by the process described in No. 4,321, or any process substantially the same." *BASF*, 111 U.S. at 296; *see also id.* at 305-06. Cochrane's "bisulpho-acid process" produced artificial alizarine, but in a different form from the bromine process of the 4,321 patent. *Id.* at 305. BASF continued to argue, however, that its patent embraced all forms of artificial alizarine. To this the Supreme Court responded that because artificial alizarine can take different forms, BASF's claim would be indefinite unless limited to the described process:

[U]nless it is shown that the process of No. 4,321 was followed to produce the defendants' article, or unless it is shown that that article could not be produced by any other process, the

defendants' article cannot be identified as the product of the process of No. 4,321. . . . If the words of the claim are to be construed to cover all artificial alizarine, whatever its ingredients, . . . we then have a patent for a product or composition of matter, which gives no information as to how it is to be identified.

*Id.* at 310.

Footnote 7. The United States Court of Claims followed *BASF's* rule in *Tri-Wall Containers v. United States*, 408 F.2d 748, 161 USPQ 116 (Ct. Cl.), *cert. denied*, 396 U.S. 828 [163 USPQ 704] (1969):

[T]he addition of a method step in a product claim, which product is not patentably distinguishable from the prior art, cannot impart patentability to the old product.

*Id.* at 750-51. In adopting the opinion of one of its trial commissioners, the Court of Claims ensured that an applicant who seeks rights only to a new process may not validly claim an old product. The applicant could only claim rights to a new process.

Footnote 8. Cases referred to by Chisum as supporting a contrary position involved patentability and not infringement.

Footnote 9. During this "rule of necessity" era, applicants had to justify product-by-process claims with a showing that they could not otherwise claim their invention. *See, e.g., Ex parte Tiffin*, 167 USPQ 359, 360 (Bd. App. 1969). For this reason, applicants and the courts drew lines distinguishing product claims which included incidentally a process limitation from products claimed solely or primarily in process terms. *See, e.g., In re Moore*, 439 F.2d 1232, 1236, 169 USPQ 236, 239 (CCPA 1971) (The structural claim included the process words "highly fluorinated." The court expressly found that these were not product-by-process claims.). In *Moore*, the product claims contained sufficient structural characteristics to define the invention even though it also contained a reference to how the product was made. *Id.*; *In re Steppan*, 394 F.2d 1013, 156 USPQ 143 (CCPA 1967) (The claim referred to a "condensation product." The court found no product-by-process claim.); *In re Luck*, 476 F.2d 650, 177 USPQ 523 (CCPA 1973). Product-by-process claims, on the other hand, define the invention solely or primarily in terms of process. *See, e.g., In re Hughes*, 469 F.2d 1216, 182 USPQ 106 (CCPA 1974).

Footnote 10. Infringement litigation, however, did not confront this administrative difficulty. In focusing on a single patent, a trial court could adduce evidence showing precisely the product resulting from the claimed process. Then a comparison with prior art products facilitated a judgment of validity in light of sections 102 and 103.



**- End of Case -**

In re Gorman (CA FC) 18 USPQ2d 1885

**In re Gorman**

**U.S. Court of Appeals Federal Circuit  
18 USPQ2d 1885**

**Decided May 13, 1991  
No. 90-1362**

**Headnotes**

**PATENTS**

**1. Patentability/Validity - Obviousness - Combining references (§ 115.0905)**

Patent and Trademark Office's reliance on teachings of large number of references in rejecting patent application for obviousness does not, without more, weigh against holding of obviousness on appeal, since criterion is not number of references, but whether references are in fields which are same as or analogous to field of invention, and whether their teachings would, taken as whole, have made invention obvious to person skilled in that field.

## **2. Patentability/Validity - Construction of claims (§ 115.03)**

### **Patentability/Validity - Obviousness - In general (§ 115.0901)**

Claim which describes features of invention in great detail is nevertheless obvious in view of prior art, since claim that is narrowly and specifically drawn must still meet requirements of 35 USC 103, and details listed in claim are shown in references and thus do not contribute to unobviousness.

### **3. Patentability/Validity - Obviousness - Relevant prior art - Particular inventions (§ 115.0903.03)**

#### **Patentability/Validity - Obviousness - Combining references (§ 115.0905)**

Application claim for candy sucker on stick, molded in elastomeric mold in shape of human thumb, is obvious in view of prior art, since all elements of claim, including molded lollipop having chewing gum base plug, with elastomeric mold serving as product wrapper, and candy in shape of human thumb, are shown in prior art references in various subcombinations, used in same manner and for same purpose as in claimed invention.

## **Case History and Disposition:**

Appeal from the U.S. Patent and Trademark Office, Board of Patent Appeals and Interferences.

Patent application of Jeffrey B. Gorman and Marilyn Katz, serial no. 06/882,480 (composite food product). From decision of Board of Patent Appeals and Interferences upholding examiner's rejection of all claims in application, applicants appeal. Affirmed.

**Attorneys:**

Thomas W. Tolpin, Highland Park, Ill., for appellant.

Teddy S. Gron, associate solicitor (Fred E. McKelvey, solicitor, with him on brief), for appellee.

**Judge:**

Before Rich, Newman, and Rader, circuit judges.

**Opinion Text**

**Opinion By:**

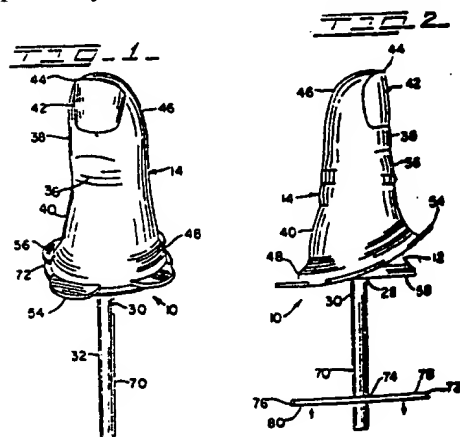
Newman, J.

Jeffrey B. Gorman and Marilyn Katz (hereinafter "Gorman") appeal the decision of the United States Patent and Trademark Office, Board of Patent Appeals and Interferences (the "Board") denying patentability to all the claims of Gorman's patent application Serial No. 06/882,480, entitled "Composite Food Product." We affirm.

***The Invention***

The claimed invention is a composite candy sucker on a stick, molded in an elastomeric mold in the shape of a human thumb. During the manufacturing process liquid candy is poured into the mold, and an edible plug of bubble or chewing gum or chocolate or food-grade wax is poured into the mold after the candy has hardened, serving as a seal for the end portion of the candy. A paper or plastic disc abuts and covers the plug. The mold serves as a cover that can be removed from the candy by means of protruding flanges. The cover is described as a "toy and novelty item".

Figure 1 shows the invention in the form in which it is marketed. Figure 2 shows the cover partially removed to reveal the candy portion (12) and the chewable or edible plug (58):



The claims describe the product in detail, as is apparent from claim 16, the claim pressed by Gorman in this appeal:

16. A composite food product, comprising:  
a candy core, said candy core being in a generally liquified form when formulated,

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heated, blended and poured into a mold and in a substantially thumb-shaped hardened form when cooled and removed from said mold;  
said thumb-shaped hardened form comprising said candy core positioned along a vertical axis

and comprising a rigid joint-shaped portion, a rigid upper portion extending upwardly from said rigid joint-shaped portion along said vertical axis, and a rigid lower portion extending downwardly from said rigid joint-shaped portion along said vertical axis, said upper portion having a rigid finger nail-shaped portion with an upper rigid tip providing a rigid top end of said thumb-shaped hardened form and a rigid convex back extending rearwardly and downwardly from said rigid tip, and said rigid lower portion having a rigid bottom end and defining a recessed opening comprising a handle-receiving socket about said vertical axis;

a removable resilient shell comprising a substantially thumb-shaped, elastomeric material selected from the group consisting of rubber and flexible plastic, said shell providing a mold for receiving and molding said liquified candy form,

a removable outer protective cover positioned about and covering said hardened form comprising said candy core, and

a toy and novelty item for placement upon the thumb of the user when removed from said hardened form comprising said candy core;

said thumb-shaped elastomeric material comprising said removable resilient shell comprising a flexible joint-shaped portion, a flexible upper portion extending upwardly from said flexible joint-shaped portion along said vertical axis, and a flexible lower portion extending downwardly from said flexible joint-shaped portion along said vertical axis, said upper portion having a flexible finger nail-shaped portion with an upper flexible tip providing a flexible top end of said shell and a flexible convex back extending rearwardly and downwardly from said flexible tip, and said flexible lower portion having an enlarged open ended diverging base, said base having a larger circumference and transverse cross-sectional area than other portions of said shell and providing the bottom of said shell, said open ended base defining a plug-receiving chamber and an access opening for entrance of said liquified form and discharge of said hardened candy form, and a set of substantially symmetrical arcuate lobes extending radially outwardly from said base, said lobes being circumferentially spaced from each other and providing manually grippable flange portions to facilitate manual removal of said shell from said core;

a plug positioned in said plug-receiving chamber adjacent said bottom of said shell, said plug abutting against the bottom of said core and providing a cap for substantially plugging and sealing the open end of said mold and cover to help enclose said candy core, and said plug comprising a food grade material selected from the group consisting of bubble gum, chewing gum, chocolate, and food grade wax;

a handle having a connecting portion connected to said plug and said candy core and positioned in said plug-receiving opening and having a manually grippable handle portion extending downward from said connecting portion along said vertical axis; and a substantially planar annular disk for abuttingly engaging and removably seating against said base and said lobes adjacent said plug, said disk defining a central axial hole for slidably receiving said handle portion and having an outer edge with a maximum span larger than said access opening but less than the maximum diameter of said symmetrical set of lobes to substantially minimize the interference with manually gripping of said manual grippable flange portions of said lobes, said disk being of a material selected from the group consisting of paper, paperboard, and plastic, and providing a removable closure member and seal for substantially closing said access opening and sealing said plug and said candy core within said shell. The claims were rejected in view of thirteen references. The primary references, patents to Siciliano, Copeman, and Pooler, show ice cream or candy molded in a plastic, rubber or elastomeric mold. In Siciliano and Copeman the mold also serves as the product wrapper. In Siciliano the ice cream is poured into the mold, a stick is inserted, the ice cream is hardened, and a cardboard cover seals the area between the stick and the elastomeric wrapper. Copeman and Kuhlke show candy lollipops molded in elastomeric molds. Copeman states that the mold may take "varying shapes, such as in the form of fruit, or animals" and Kuhlke discusses the desirability of sealing candy from the outside air. In Siciliano, Copeman and Kuhlke, the mold is peeled from the confection prior to use. The two Nolte patents teach that gripping flanges may be placed on an ice cream wrap

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per to facilitate removal. Ahern and Knaust each show a disc-shaped seal or cover for a frozen confection. Ahern shows the cover in conjunction with ice cream on a stick. Harris shows a hollow thumb-shaped lollipop into which the thumb is inserted, and Craddock shows a thumb-shaped confection supported on a disc-shaped handle; in both cases without the other elements shown by Gorman. Fulkerson shows a candy coating surrounding a block of ice cream, and a candy plug for retaining liquid syrup inside a cavity in the ice cream. Webster shows chewing gum entirely enclosing a liquid syrup product. Spiegel shows a chocolate layer having an alcohol diffusion barrier to plug the end of a plastic container of liqueur. Fulkerson,

Webster and Spiegel all suggest the greater appeal to consumers of providing two different components in the same confection.

The Board found that all of the features of Gorman's product were known to the art, and that various combinations of these elements existed in known similar structures. The Board concluded that the applicant's claimed combination was suggested by and would have been obvious in light of the references.

## Discussion

### A

Each element of the Gorman claims is in the prior art, separately or in sub-combination. Gorman argues that when it is necessary to combine the teachings of a large number of references in order to support a rejection for obviousness under 35 U.S.C. §103, this of itself weighs against a holding of obviousness.

[1] The criterion, however, is not the number of references, but what they would have meant to a person of ordinary skill in the field of the invention. In *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1383, 231 USPQ 81, 93 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987), the court held that a combination of about twenty references that "skirt[ed] all around" the claimed invention did not show obviousness. In other instances, on other facts, we have upheld reliance on a large number of references to show obviousness. Compare *In re Miller*, 159 F.2d 756, 758-58, 72 USPQ 512, 514-15 (CCPA 1947) (rejecting argument that the need for eight references for rejection supported patentability) with *Kansas Jack, Inc. v. Kuhn*, 719 F.2d 1144, 1149, 219 USPQ 857, 860 (Fed. Cir. 1983) (where teachings relied upon to show obviousness were repeated in a number of references, the conclusion of obviousness was strengthened). *See also, e.g., In re Troiel*, 274 F.2d 944, 947, 124 USPQ 502, 504 (CCPA 1960) (rejecting appellant's argument that combining a large number of references to show obviousness was "farfetched and illogical").

Determination of whether a new combination of known elements would have been obvious to one of ordinary skill depends on various facts, including whether the elements exist in "analogous art", that is, art that is reasonably pertinent to the problem with which the inventor is concerned. *In re Deminski*, 796 F.2d 436, 442, 230 USPQ 313, 315 (Fed. Cir. 1986). When the references are all in the same or analogous fields, knowledge thereof by the hypothetical person



of ordinary skill is presumed, *In re Sernaker*, 702 F.2d 989, 994, 217 USPQ 1, 5 (Fed. Cir. 1983), and the test is whether the teachings of the prior art, taken as a whole, would have made obvious the claimed invention. See *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991).

When it is necessary to select elements of various teachings in order to form the claimed invention, we ascertain whether there is any suggestion or motivation in the prior art to make the selection made by the applicant. *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1985). "Obviousness can not be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." *In re Bond*, 910 F.2d 831, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990) (quoting *Carella v. Starlight Archery and Pro Line Co.*, 804 F.2d 135, 140, 231 USPQ 644, 647 (Fed. Cir. 1986)).

The extent to which such suggestion must be explicit in, or may be fairly inferred from, the references, is decided on the facts of each case, in light of the prior art and its relationship to the applicant's invention. As in all determinations under 35 U.S.C. §103, the decisionmaker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's structure as a template and selecting elements from references to fill the gaps. *Interconnect Planning*, 774 F.2d at 1143, 227 USPQ at 551. The references themselves must provide some teaching whereby the applicant's combination would have been obvious.

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## **B**

Gorman argues that the references showing ice cream in a mold or wrapper on a stick and the references showing candy in a mold or wrapper on a stick are not analogous, for they require different conditions of production. However, the Copeman reference shows the close relationship of these arts, stating that his elastomeric mold may be used for "frozen confections and other solid confections". We conclude that the ice cream on a stick and candy on a stick arts are analogous, and that the Siciliano, Copeman, Pooler, and Kuhlke references show or suggest

Gorman's candy on a stick and covered with an elastomeric mold, for which the thumb-shape is shown by Harris or Craddock.

The suggestion of providing a layer of chewing gum, chocolate or the like, surrounding the candy core in the area not covered by the mold, to seal the candy and provide a second food product, is provided by Fulkerson, Webster, or Spiegel. The paper disc adjacent the base of the candy structure is shown in Ahern and Knaust. Harris and Craddock both show thumb-shaped candy. Gorman argues that the prior art does not suggest using the thumb-shaped cover as a toy after the candy is removed. However, Copeman states that his rubber mold may be used as a "toy balloon" after the candy is removed. Gorman argues that Craddock teaches away from the claimed invention because of Craddock's admonition that lollipops on sticks are dangerous to children. However, candy on a stick is too well known for this caution to contribute to unobviousness.

[2] Claim 16 recites details such as a "joint-shaped portion", a "finger nail portion", an "upper portion", a "lower portion" and a "convex back", as descriptive of the thumb shape. Such details are shown in the references and do not contribute to unobviousness. A claim that is narrowly and specifically drawn must nevertheless meet the requirements of §103:

The mere fact that a claim recites in detail all of the features of an invention (i.e., is a "picture claim") is never, in itself, justification for the allowance of such a claim.

Manual of Patent Examining Procedure, §706 (Rev. 6, Oct. 1987) at p. 700-6; *In re Romito*, 289 F.2d 518, 129 USPQ 359 (CCPA 1961) (rejecting a "picture claim").

[3] Applying the principles of *Graham v. John Deere & Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966), we discern all of the elements of claim 16, used in substantially the same manner, in devices in the same field of endeavor. The various elements Gorman combined: the molded lollipop with a chewing gum plug, with the mold serving as the product wrapper; and candy in the shape of a thumb; are all shown in the cited references in various sub-combinations, used in the same way, for the same purpose as in the claimed invention. The Board did not, as Gorman argues, pick and choose among isolated and inapplicable disclosures in the prior art. Rather, the claim elements appear in the prior art in the same configurations, serving the same functions, to achieve the results suggested in prior art. *In re Sernaker*, 702 F.2d at 994, 217 USPQ at 5. The large number of cited references does not negate the obviousness of the combination, for the prior art uses the various elements for the same purposes as they are used by appellants, making the claimed invention as a whole obvious in terms of 35 U.S.C. §103.

The Board's decision is *AFFIRMED*.

- End of Case -

In re Fine (CA FC) 5 USPQ2d 1596

**In re Fine**

**U.S. Court of Appeals Federal Circuit  
5 USPQ2d 1596**

**Decided January 26, 1988  
No. 87-1319**

**Headnotes**

**PATENTS**

**1. Patentability/Validity -- Obviousness -- Evidence of (§ 115.0903)**

Patent and Trademark Office improperly rejected claimed invention for obviousness since nothing in cited references, either alone or in combination, suggests or teaches claimed invention, since there is consequently no support for PTO's conclusion that substitution of one type of detector for another in prior art system, resulting in claimed invention, would have been obvious, and since PTO therefore failed to satisfy its burden of establishing prima facie case of

obviousness by showing some objective teaching or generally available knowledge that would lead one skilled in art to combine teachings of existing references.

**2. Patentability/Validity -- Obviousness -- In general (§ 115.0901)**

Obviousness is tested by what combined teachings of prior art references would have suggested to those of ordinary skill in art, not by whether particular combination of elements from such references might have been "obvious to try."

**3. Patentability/Validity -- Obviousness -- Evidence of (§ 115.0903)**

Patent and Trademark Office erred, in rejecting as obvious system for detecting and measuring minute quantities of nitrogen compounds, by failing to recognize that appealed claims can be distinguished over combination of prior art references, in view of evidence demonstrating that prior art does not teach claimed temperature range, despite some overlap of preferred temperature ranges for claimed invention and prior art, since purposes of preferred temperature ranges are different and overlap is mere happenstance.

**4. Patentability/Validity -- Obviousness -- In general (§ 115.0901)**

Dependent claims are non-obvious under 35 USC 103 if claims from which they depend are non-obvious.

**Case History and Disposition:**

Appeal from the U.S. Patent and Trademark Office Board of Patent Appeals and Interferences.

Application for patent by David H. Fine, Serial No. 512,374. From decision of Board of Patent Appeals and Interferences affirming rejection of application, applicant appeals. Reversed; Smith, circuit judge, dissenting with opinion.

**Attorneys:**

Morris Relson and Darby & Darby, New York, N.Y., (Beverly B. Goodwin with them on the brief) for appellant.

Lee E. Barrett, associate solicitor, Arlington, Va., (Joseph F. Nakamura, solicitor, and Fred E. McKelvey, deputy solicitor, with him on the brief) for appellee.

**Judge:**

Before Friedman, Smith, and Mayer, circuit judges.

**Opinion Text**

**Opinion By:**

Mayer, J.

David H. Fine appeals from a decision of the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office (Board) affirming the rejection of certain claims of his application, Serial No. 512,374, and concluding that his invention would have been obvious to one of ordinary skill in the art and was therefore unpatentable under 35 U.S.C. §103. We reverse.

## Background

### **A. *The Invention .***

The invention claimed is a system for detecting and measuring minute quantities of nitrogen compounds. According to Fine, the system has the ability to detect the presence of nitrogen compounds in quantities as minute as one part in one billion, and is an effective means to detect drugs and explosives, which emanate nitrogen compound vapors even when they are concealed in luggage and closed containers.

The claimed invention has three major components: (1) a gas chromatograph which separates a gaseous sample into its constituent parts; (2) a converter which converts the nitrogen compound effluent output of the chromatograph into nitric oxide in a hot, oxygen-rich environment; and (3) a detector for measuring the level of nitric oxide. The claimed invention's sensitivity is achieved by combining nitric oxide with ozone to produce nitrogen dioxide which concurrently causes a detectable luminescence. The luminescence, which is measured by a visual detector, shows the level of nitric oxide which in turn is a measure of nitrogen compounds found in the sample.

The appealed claims were rejected by the Patent and Trademark Office (PTO) under 35 U.S.C. §103. Claims 60, 63, 77 and 80 were rejected as unpatentable over Eads, Patent No. 3,650,696 (Eads) in view of Warnick, et al., Patent No. 3,746,513 (Warnick). Claims 62, 68, 69, 79, 85 and 86 were rejected as unpatentable over Eads and Warnick in view of Glass, et al., Patent No. 3,207,585 (Glass).

### **B. *The Prior Art .***

#### **1. *Eads Patent .***

Eads discloses a method for separating, identifying and quantitatively monitoring sulfur compounds. The Eads system is used primarily in "air pollution control work in the scientific characterization of odors from sulfur compounds."

The problem addressed by Eads is the tendency of sulfur compounds "to adhere to or react with the surface materials of the sampling and analytical equipment, and/or react with the liquid or gaseous materials in the equipment." Because of this, the accuracy

cy of measurement is impaired. To solve the problem, the Eads system collects an air sample containing sulfur compounds in a sulfur-free methanol solution. The liquid is inserted into a gas chromatograph which separates the various sulfur compounds. The compounds are next sent through a pyrolysis furnace where they are oxidized to form sulfur dioxide. Finally, the sulfur dioxide passes through a measuring device called a microcoulometer which uses titration cells to calculate the concentration of sulfur compounds in the sample.

## **2. Warnick Patent .**

Warnick is directed to a means for detecting the quantity of pollutants in the atmosphere. By measuring the chemiluminescence of the reaction between nitric oxide and ozone, the Warnick device can detect the concentration of nitric oxide in a sample gaseous mixture.

Warnick calls for "continuously flowing" a sample gaseous mixture and a reactant containing ozone into a reaction chamber. The chemiluminescence from the resulting reaction is transmitted through a light-transmitting element to produce continuous readouts of the total amount of nitric oxide present in the sample.

## **3. Glass Patent.**

The invention disclosed in Glass is a device for "completely burning a measured amount of a substance and analyzing the combustion products." A fixed amount of a liquid petroleum sample and oxygen are supplied to a flame. The flame is then spark-ignited, causing the sample to burn. The resulting combustion products are then collected and measured, and from this measurement the hydrogen concentration in the sample is computed.

## **C. The Rejection .**

The Examiner rejected claims 60, 63, 77 and 80 because "substitution of the [nitric oxide] detector of Warnick for the sulfur detector of Eads would be an obvious consideration if interested in nitrogen compounds, and would yield the claimed invention." He further asserted that "Eads teaches the [claimed] combination of chromatograph, combustion, and detection, in that order. . . . Substitution of detectors to measure any component of interest is well within the skill of the art." In rejecting claims 62, 68, 69, 79, 85 and 86, the Examiner said, "Glass et al.



teach a flame conversion means followed by a detector, and substitution of the flame conversion means of Glass et al. for the furnace of Eads would be an obvious equivalent and would yield the claimed invention." The Board affirmed the Examiner's rejection.

### **Discussion**

#### **A. Standard of Review .**

Obviousness under 35 U.S.C. §103 is " 'a legal conclusion based on factual evidence.' " *Stratoflex, Inc. v. Aeroquip Corp.* , 713 F.2d 1530, F.2d 1530, 1535, 218 USPQ 871, 876 (Fed. Cir. 1983) (quoting *Stevenson v. Int'l Trade Comm'n* , 612 F.2d 546, 549, 204 USPQ 276, 279 (CCPA 1979) ). Therefore, an obviousness determination is not reviewed under the clearly erroneous standard applicable to fact findings, *Raytheon Co. v. Roper Corp.* , 724 F.2d 951, 956, 220 USPQ 592, 596 (Fed. Cir. 1983); it is "reviewed for correctness or error as a matter of law." *In re De Blauwe* , 736 F.2d 699, 703, 222 USPQ 191, 195 (Fed. Cir. 1984).

To reach a proper conclusion under §103, the decisionmaker must step backward in time and into the shoes worn by [a person having ordinary skill in the art] when the invention was unknown and just before it was made. In light of *all* the evidence, the decisionmaker must then determine whether . . . the claimed invention as a whole would have been obvious at *that* time to *that* person. 35 U.S.C. §103. The answer to that question partakes more of the nature of law than of fact, for it is an ultimate conclusion based on a foundation formed of all the probative facts.

*Panduit Corp. v. Dennison Mfg. Co.* , 810 F.2d 1561, 1566, 1 USPQ2d 1593, 1595-96 (Fed. Cir. 1987).

#### **B. Prima Facie Obviousness .**

Fine says the PTO has not established a *prima facie* case of obviousness. He contends the references applied by the Board and Examiner were improperly combined, using hindsight reconstruction, without evidence to support the combination and in the face of contrary teachings in the prior art. He argues that the appealed claims were rejected because the PTO thought it would have been "obvious to try" the claimed invention, an unacceptable basis for rejection.

[1] We agree. The PTO has the burden under section 103 to establish a *prima facie* case of obviousness. See *In re Piasecki* , 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-87 (Fed. Cir. 1984). It can satisfy this burden only by showing some objective teaching in the prior art or that

knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. *In re Lalu* , 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1984); *see also Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.* ,

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776 F.2d 281, 297 n.24, 227 USPQ 657 , 667 n.24 (Fed. Cir. 1985); *ACS Hosp. Sys., Inc. v. Montefiore Hosp.* , 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). This it has not done. The Board points to nothing in the cited references, either alone or in combination, suggesting or teaching Fine's invention.

The primary basis for the Board's affirmance of the Examiner's rejection was that it would have been obvious to substitute the Warnick nitric oxide detector for the Eads sulfur dioxide detector in the Eads system. The Board reiterated the Examiner's bald assertion that "substitution of one type of detector for another in the system of Eads would have been within the skill of the art," but neither of them offered any support for or explanation of this conclusion.

Eads is limited to the analysis of sulfur compounds. The particular problem addressed there is the difficulty of obtaining precise measurements of sulfur compounds because of the tendency of sulfur dioxide to adhere to or react with the sampling analytic equipment or the liquid or gaseous materials in the equipment. It solves this problem by suggesting that the gaseous sample containing sulfur compounds be absorbed into sulfur-free methanol and then inserted into a gas chromatograph to separate the sulfur compounds.

There is no suggestion in Eads, which focuses on the unique difficulties inherent in the measurement of sulfur, to use that arrangement to detect nitrogen compounds. In fact, Eads says that the presence of nitrogen is undesirable because the concentration of the titration cell components in the sulfur detector is adversely affected by substantial amounts of nitrogen compounds in the sample. So, instead of suggesting that the system be used to detect nitrogen compounds, Eads deliberately seeks to avoid them; it warns against rather than teaches Fine's invention. *See W. L. Gore & Assoc. v. Garlock, Inc.* , 721 F.2d 1540, 1550, 220 USPQ 303, 311 (Fed. Cir. 1983) (error to find obviousness where references "diverge from and teach away from the invention at hand"). In the face of this, one skilled in the art would not be expected to combine a nitrogen-related detector with the Eads system. Accordingly, there is no suggestion to combine Eads and Warnick.

Likewise, the teachings of Warnick are inconsistent with the claimed invention, to some extent. The Warnick claims are directed to a gas stream from engine exhaust "continuously flowing the gaseous mixtures into the reaction chamber" to obtain "continuous readouts" of the amount of nitric oxide in the sample. The other words, it contemplates measuring the total amount of nitric oxide in a continuously flowing gaseous mixture of unseparated nitrogen constituents. By contrast, in Fine each nitrogen compound constituent of the gaseous sample is retained in the Chromatograph for an individual time period so that each exists in discrete, time-separated pulses. \* By this process, each constituent may be both identified by its position in time sequence, and measured. The claimed system, therefore, diverges from Warnick and teaches advantages not appreciated or contemplated by it.

Because neither Warnick nor Eads, alone or in combination, suggests the claimed invention, the Board erred in affirming the Examiner's conclusion that it would have been obvious to substitute the Warnick nitric oxide detector for the Eads sulfur dioxide detector in the Eads system. *ACS Hosp. Sys.*, 732 F.2d at 1575-77, 221 USPQ at 931-33. The Eads and Warnick references disclose, at most, that one skilled in the art might find it obvious to try the claimed invention. But whether a particular combination might be "obvious to try" is not a legitimate test of patentability. *In re Geiger*, 815 F.2d 868, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987); *In re Goodwin*, 576 F.2d 375, 377, 198 USPQ 1, 3 (CCPA 1978).

[2] Obviousness is tested by "what the combined teachings of the references would have suggested to those of ordinary skill in the art." *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). But it "cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination." *ACS Hosp. Sys.*, 732 F.2d at 1577, 221 USPQ at 933. And "teachings of references can be combined *only* if there is some suggestion or incentive to do so." *Id.* Here, the prior art contains none.

Instead, the Examiner relies on hindsight in reaching his obviousness determination.

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But this court has said, "To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which

only the inventor taught is used against its teacher." *W. L. Gore* , 721 F.2d at 1553, 220 USPQ at 312-13. It is essential that "the decisionmaker forget what he or she has been taught at trial about the claimed invention and cast the mind back to the time the invention was made . . . to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art." *Id* . One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.

### **C. Advantage Not Appreciated by the Prior Art .**

[3] The Board erred not only in improperly combining the Eads and Warnick references but also in failing to appreciate that the appealed claims can be distinguished over that combination. A material limitation of the claimed system is that the conversion to nitric oxide occur in the range of 600°C to 1700°C. The purpose of this limitation is to prevent nitrogen from other sources, such as the air, from being converted to nitric oxide and thereby distorting the measurement of nitric oxide derived from the nitrogen compounds of the sample.

The claimed nitric oxide conversion temperature is not disclosed in Warnick. Although Eads describes a preferred temperature of 675°C to 725°C, the purpose of this range is different from that of Fine. Eads requires the 675°C to 725°C range because it affords a temperature low enough to avoid formation of unwanted sulfur trioxide, yet high enough to avoid formation of unwanted sulfides. Fine's temperature range, in contrast, does not seek to avoid the formation of sulfur compounds or even nitrogen compounds. It enables the system to break down the nitrogen compounds of the sample while avoiding the destruction of background nitrogen gas. There is a partial overlap, of course, but this is mere happenstance. Because the purposes of the two temperature ranges are entirely unrelated, Eads does not teach use of the claimed range. *See In re Geiger* , 815 F.2d at 688, 2 USPQ2d at 1278. The Board erred by concluding otherwise.

### **D. Unexpected Results .**

Because we reverse for failure to establish a *prima facie* case of obviousness, we need not reach Fine's contention that the Board failed to accord proper weight to the objective evidence of unexpected superior results. *Id* .

### **E. The "Flame" Claims .**

[4] Claims 62, 68, 69, 79, 85 and 86 relate to the oxygen-rich flame conversion means of the claimed invention. These "flame" claims depend from either apparatus claim 60 or method claim 77. Dependent claims are nonobvious under section 103 if the independent claims from which they depend are nonobvious. *Hartness Int'l, Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed. Cir. 1987); *In re Abele*, 684 F.2d 902, 910, 214 USPQ 682, 689 (CCPA 1982); *see also In re Sernaker*, 702 F.2d 989, 991, 217 USPQ 1, 3 (Fed. Cir. 1983). In view of our conclusion that claims 60 and 77 are nonobvious, the dependent "flame" claims are also patentable.

### **Conclusion**

The Board's decision affirming the Examiner's rejection of claims 60, 62, 63, 68, 69, 77, 79, 80, 85 and 86 of Fine's application as unpatentable over the prior art under 35 U.S.C. §103 is **REVERSED**.

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### **Footnotes**

Footnote \*. The Solicitor argues that the contents of Attachment C of Fine's brief were not before the Board and may not properly be considered here. However, we need not rely on Attachment C. It is merely illustrative of the qualitative separation of nitrogen compounds which occurs in Fine's system. The fact that the various constituents exit at discrete intervals is shown by the specification which was before the Board and which may appropriately be considered on appeal. *See, e.g., Astra-Sjuco, A.B. v. United States Int'l Trade Comm'n*, 629 F.2d 682, 686, 207 USPQ 1, 5 (CCPA 1980) (claims must be construed in light of specification).

### **Dissenting Opinion Text**

#### **Dissent By:**

Smith, circuit judge, dissenting.

I respectfully dissent. I am of the firm belief that the prior art references, relied upon by the PTO

to establish its prima facie case of obviousness, in combination teach and suggest Fine's invention to one skilled in the art. Also, I firmly believe that Fine failed to rebut the PTO's prima facie case. On this basis, I would affirm the board's determination sustaining the examiner's rejection, pursuant to 35 U.S.C. §103, of Fine's claims on appeal before this court.

**- End of Case -**

**In re TABORSKY, 183 USPQ 50 (CCPA 1974)**

**In re TABORSKY**

**(CCPA)  
183 USPQ 50**

**Decided Aug. 29, 1974**

**No. 9183**

**U.S. Court of Customs and Patent Appeals**

**Headnotes**

**PATENTS**

**1. Patentability — Invention — In general (§ 51.501)**

In determining propriety of Patent Office case for prima facie obviousness, it is necessary to ascertain whether prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making proposed substitution or other modification.

**2. Patentability — Composition of matter (§ 51.30)**

Claims should not be rejected under 35 U.S.C. 103 where prior art provides one of ordinary skill in the art with no motivation to make proposed molecular modifications needed to arrive at applicant's claimed compounds.

**3. Patentability — Composition of matter (§ 51.30)**

Since comparative evidence demonstrates that claimed compounds possess biological activities beyond what could reasonably be predicted by person of ordinary skill in the art, it is unnecessary for court to specifically pass on issue of whether these compounds are prima facie obvious since, even if they are, the prima facie case has been overcome by the evidence; compound and its properties are inseparable in patent law.

**Particular patents—3-Nitrohalosalicylanilides**

Taborsky, 3-Nitrohalosalicylanilides, claims 1 to 8 of application allowed.

**Case History and Disposition:**

Appeal from Board of Appeals of the Patent Office.

Application for patent of Robert G. Taborsky, Serial No. 730,596, filed May 20, 1968; Patent Office Group 121. From decision rejecting claims 1 to 8, applicant appeals. Reversed.

**Attorneys:**

ARTHUR L. CAIN and CAIN & LOBO, both of Cleveland, Ohio, for appellant.

JOSEPH F. NAKAMURA (HENRY W. TARRING II of counsel) for Commissioner of Patents.

**Judge:**

Before MARKEY, Chief Judge, and RICH, BALDWIN, LANE, and MILLER, Associate Judges.

**Opinion Text**

**Opinion By:**

LANE, Judge.

This is an appeal from the decision of the

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Patent Office Board of Appeals, adhered to after reconsideration, which affirmed (with one examiner-in-chief dissenting) the rejection under 35 U.S.C. 103 of claims 1 through 8 in appellant's patent application serial No. 730,596, filed May 20, 1968, <sup>1</sup> for "3-Nitrohalosalicylanilides." We reverse.

**Claimed Subject Matter**

3-Nitrohalosalicylanilides have the following general structural formula (numerals indicate ring positions):

*Graphic material consisting of a chemical formula or diagram set at this point is not available.*



*See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

In the above structural formula, the left-hand aromatic ring is called the "salicyl" ring and the right-hand aromatic ring is called the "aniline" ring.

Claim 1 is a generic claim to 3-nitrohalosalicylanilides:

1. A 3-nitrohalosalicylanilide having the formula

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*  
where Y is a halogen and n is a positive integer no greater than 5. <sup>2</sup>

Claim 2 is an independent subgeneric claim reciting the structural formula shown in claim 1 where Y is a halogen and n is a positive integer no greater than 3.

Claims 3-8 are dependent on claim 2, and they recite individual chemical species where the identity or the position of the halogen substituent varies as follows:

Claim 3:

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Claim 4:

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Claim 5:

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Claim 6:

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Claim 7:

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Claim 8:

*Graphic material consisting of a chemical formula or diagram set at this point is not available.*

*See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

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The remaining claim, independent claim 9 stands allowed:

9. A 3-nitrohalosalicylanilide having the formula

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Appellant's specification states that 3-nitrohalosalicylanilides are useful, inter alia, as piscicidal agents for selectively eradicating brown bullhead fish and as selective larvicides for controlling sea lamprey, the latter having caused great damage to commercial fish, such as trout, in the Great Lakes. Data in the specification indicate that several of appellant's claimed compounds possess a significantly greater lethal effect to sea lamprey larvae than to fingerling rainbow trout.

## References

The examiner and the board relied on four prior art references:

(1) Schraufstatter and Gonnert [Schraufstatter], U. S. Patent 3,079,297, granted February 26, 1963 (filed May 31, 1960; claims benefit of earlier applications)

(2) Strufe, Schraufstatter, and Gonnert [Strufe], U. S. Patent 3,113,067, granted December 3, 1963 (filed August 23, 1960)

(3) Ioffe et al. [Ioffe I], Zhurnal Obshchei Khimii, 29:2682-2685 (August 1959)

(4) Ioffe et al. [Ioffe II], Chem. Abstracts, 54:10938 (1960)

The examiner cited another reference, not as prior art, but for the purpose of establishing "certain statements of fact" (relying on *In re Wilson*, 50 CCPA 773, 311 F.2d 266, 135 USPQ 442 (1962)):

Howell et al. [Howell], U. S. Patent 3,238,098, granted March 1, 1966 (application filed January 27, 1964) <sup>3</sup>

Appellant cited two references:

Starkey, U. S. Patent 3,309,267, granted March 14, 1967

Taborsky, U. S. Patent 3,527,865, granted September 8, 1970 <sup>4</sup>

## Rejection

The examiner rejected claims 1-8 under 35 U.S.C. 103 as "obvious over" Schraufstatter, Strufe, and the two Ioffe references. The board majority sustained this rejection and stated: "We agree with the examiner that the claimed compounds are *structurally obvious* and that the evidence offered by appellant to show that the compounds have unexpected beneficial properties fails of its objectives." (Emphasis ours.) The dissenting examiner-in-chief would have reversed the rejection because " \* \* \* the art of record fails to establish that the invention, as a whole, would have been obvious to a person having ordinary skill in the art, In re Papesch, 50 CCPA 1084, 315 F.2d 381, 137 USPQ 43 (1963)."

## Schraufstatter

The Schraufstatter patent, the first prior art reference, is entitled "Method of Combating Gastropods," and it discloses that certain derivatives of 2-hydroxy-benzoic-anilide are effective gastropodicidal agents. Schraufstatter broadly defines a genus of 2-hydroxy-benzoic-anilide derivatives having the following structural formula:

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

wherein R is hydrogen or a lower alkanoyl radical having from 1 to 4 carbon atoms and which is substituted at one of the numbered positions with a halogen atom and at another numbered position with a member selected from the group consisting of halogen and the nitro group; and further members of *the said first mentioned group* substituted at a total of up to three additional of the numbered positions with members selected from the group consisting of halogen, methyl and trifluoro methyl, the total number of halogen substituents, however, not exceeding four and the total number of nitro groups not exceeding two.

Here and in the following, chlorine, bromine and iodine are to be understood by "halogen." [Emphasis ours.]

This definition of the genus is unclear since the phrase "the said first mentioned group" is ambiguous. Nevertheless, the genus appears to include compounds where R is hydrogen, a halogen "is substituted at one of the numbered positions," and a nitro (-NO<sub>2</sub>) group is substituted "at another numbered position." Thus, the defined genus encompasses a large number of compounds, including some of appellant's claimed compounds.

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Schraufstatter then defines a subgenus of "particularly active gastropodicidal agents in accordance with the invention" which has the following formula:

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

wherein R is hydrogen or a lower alkanoyl radical having from 1 to 4 carbon atoms, R<sub>1</sub> is hydrogen or methyl, R<sub>2</sub> is chlorine or bromine, R<sub>3</sub> and R<sub>4</sub> are hydrogen, methyl, chlorine or bromine, or a nitro group, R<sub>4</sub>[sic] and R<sub>6</sub> are hydrogen, chlorine or bromine and wherein always only one nitro group and at most three halogen substituents are present.

This subgenus does not encompass appellant's claimed compounds since, by definition, only R<sub>3</sub> and R<sub>4</sub> may be nitro groups and the structural formula shows that R<sub>3</sub> and R<sub>4</sub> are always on the *aniline* ring (the right-hand ring). Appellant's claimed compounds always have the nitro group at the 3 position on the *salicyl* ring (left-hand ring).

Schraufstatter then gives "[b]y way of example" a list of the chemical names and the melting points of twenty specific derivatives of 2-hydroxy-benzoic-anilide said to be "notably useful and more or less readily producible compounds." Inspection of this list reveals that three of the twenty compounds do not contain a nitro group. The other seventeen compounds each contain at least one nitro group (one compound contains two nitro groups). Sixteen of these seventeen compounds have the nitro group(s) located on the *aniline* ring *as required by the sub-genus*, above. One of these seventeen compounds has the nitro group on the *salicyl* ring (the left-hand ring), and that compound is disclosed as follows:

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

To illustrate, the named prior art compound has the following structural formula:  
*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

### **[prior art]**

This compound departs from the definition of the sub-genus since it has the nitro group on the *salicyl* ring (the left-hand ring) whereas the sub-genus requires that the nitro group be located on the *aniline* ring.

What remains in Schraufstatter—working examples of how to synthesize eight specific compounds, a table showing minimum concentrations needed to produce a 100% death rate in snails after 24 hours using specific compounds, and a working example of how to prepare compositions consisting of the active ingredient plus a carrier (e.g.—an emulsifier)—is concerned only with compounds which come within the defined sub-genus.

The prior art compound, 5-nitro-4-chlorosalicylanilide, differs structurally from the compound recited in appellant's claim 5 in the position of the nitro group on the salicyl ring. The claim 5 compound has the nitro group at the 3 position of the salicyl ring while the prior art compound has the nitro group at the 5 position of the salicyl ring. Another way of expressing this structural difference is to say that in the claim 5 compound the nitro group is in an adjacent position relative to the hydroxy (-OH) group on the salicyl ring whereas in the prior art compound the nitro group is in the opposite position relative to the hydroxy group on the salicyl ring. In short, the claim 5 compound is structurally a non-adjacent position isomer of the prior art compound.

### **Strufe**

The Strufe patent, the second prior art reference, is entitled "Alkanolamine Salts of Salicyl Anilides And Process For Their Production", and it discloses that alkanolamine salts of salicyl anilides are useful for "combating snails and slugs." The Strufe patent is related to the Schraufstatter patent in that Schraufstatter and Gonnert, the two co-inventors shown in Schraufstatter, are also co-inventors in Strufe, and the two patents indicate a common assignee.

Strufe defines a genus of alkanolamine salts of salicyl anilides as follows:

Generally the new compounds of this invention are alkanolamine salts of salicyl anilides of the general formula

*Graphic material consisting of a chemical formula or diagram set at this point is not available. See text in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

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wherein R<sub>1</sub> denotes hydrogen or an aliphatic acyl radical, R<sub>2</sub> and R<sub>3</sub> denote a nitro group, chlorine or bromine whereby at least R<sub>2</sub> and R<sub>3</sub> means a halogen atom, R<sub>4</sub> denotes hydrogen or alkyl or alkoxy groups with 1-5 carbon atoms or nitro groups whereby at least one of R<sub>4</sub> denotes a nitro group.

Strufe teaches that:

The production of the aforesaid alkanolamine salts is carried out according to known methods by reacting the salicyl anilides with alkanolamines such as a mono-ethanolamine, N-methyl-ethanol-amine or 1,2-dimethyl-ethanolamine and the like.

Strufe expressly refers to Schraufstatter when stating that:

The free salicyl anilides and their gastropod combating properties are the subject matter of \* \* \* [identifying by serial number the great-grandparent application, the grandparent application, the parent application, and the application which has] is sued to

Patent 3,079,297 [the Schraufstatter patent].

Strufe points out a practical disadvantage when using the compounds broadly disclosed by Schraufstatter:

As it is stated above it is known to use substituted 2-hydroxybenzanilides and their O-acyl compounds as gastropod combating agents; however, these compounds are barely water-soluble and have therefore several disadvantages in practice.

Strufe states that it is known to use substituted 2-hydroxybenzanilides in the form of their alkali metal salts, but that the majority of these compounds have the "disadvantage of being rapidly re-precipitated" in water containing mineral salts, and therefore they are "not very suitable for combating snails living in water."

Having thus described a practical problem confronting those skilled in the art, Strufe indicates that he has solved the problem by producing and using alkanolamine salts of salicyl-anilides " \* \* \* which are not precipitated in an aqueous mineral-salt-containing solution [and] which are stable even without addition of emulsifiers \* \* \*."

Strufe then gives working examples of how to prepare nine specific alkanolamine salts of salicyl anilides. The salicylanilide starting compound in each example is either a 2- $\phi$ -nitro-salicylanilide or a 4- $\phi$ -nitrosalicylanilide, viz., where the nitro group is substituted on the aniline ring.

Following the working examples is a list of fourteen "[o]ther salicylanilides which can be reacted with suitable alkanolamines to give useful compounds \* \* \*." Among the fourteen compounds is: "5-nitro-4- $\phi$ -chlorosalicylanilide (M.P. 252°)."

As in Schraufstatter, this is the sole compound specifically disclosed in the list or in the entire reference where the nitro group is on the salicyl ring, and the chemical name and melting point are the sole disclosures relevant to the compound.

## **offe I and II**

The third and fourth prior art references are Ioffe I and Ioffe II, respectively. Ioffe I is a technical paper entitled "N-Substituted Amides of Salicylic Acid and Its Derivatives. I. Arylides of 3,5-Dichlorosalicylic and 5-Nitrosalicylic Acids.", translated from a Russian chemical journal. Ioffe II is cumulative to Ioffe I since Ioffe II is the abstract of Ioffe I published in Chemical Abstracts.

Ioffe I is mainly concerned with methods of chemical synthesis, and the authors conclude that the best method of preparing arylides of salicylic acid is by "the direct alloying of salol [phenyl salicylate] with amines." They state that the derivatives produced by their "salol method" are "more pure" than the same derivatives when prepared by reacting a substituted-salicylic acid with a substituted-amine in the presence of phosphorus trichloride. Ioffe I presents tables showing twelve specific derivatives of 3,5-dichlorosalicylic acid and the corresponding twelve specific

derivatives of 5-nitrosalicylic acid. Among the twelve derivatives of 5-nitrosalicylic acid is the following compound:

*Table set at this point is not available. See table in hard copy or call BNA PLUS at 1-800-452-7773 or 202-452-4323.*

Hence, Ioffe I discloses the same compound, 5-nitro-4-chlorosalicylanilide, shown by Schraufstatter and Strufe. The examiner recognized that Ioffe I was cumulative to Schraufstatter and Strufe, and stated that Ioffe I "was cited because of its date." Ioffe I does not disclose any biological utility for this compound or for any derivative of 5-nitrosalicylic acid. Ioffe I only states that: "In reduction, the arylides of the 5-nitrosalicylic acid are transformed into corresponding arylides of the 5-amino-salicylic acid, which are diazotized and form azo dyes together with azocomponents."

### **Opinion**

The general issue is whether the cited prior art established that " \* \* \* the *differences* between the subject matter sought to be patented and the prior art are such that the subject matter *as a whole* would have been obvious *at the time the invention was made* to a person having ordinary skill in the art \* \* \*." 35 U.S.C. 103 (emphasis ours). The specific issues are

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whether appellant's claimed chemical compounds are prima facie obvious because of structural similarity to the cited prior art and, if so, whether there is a sufficient showing to rebut prima facie obviousness.

### ***Fluoro-Substituted Compounds***

With respect to the compounds recited in claims 1 and 2 when Y is fluorine and with respect to the compound 3-nitro-4-fluorosallylanilide recited in claim 6, we hold that the cited prior art fails to establish prima facie obviousness. To arrive at these fluoro-substituted compounds, one must modify the closest prior art compound, 5-nitro-4-chlorosalicylanilide, in two essential ways, first by changing the position of the nitro group from the 5 position to the 3 position, and second, by changing the identity of the halo-substituent from chloro to fluoro.

[1] In determining the propriety of the Patent Office case for prima facie obviousness, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the proposed substitution or other modification. In re Lintner, 59 CCPA 1004, 1007, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (1972).

[2] Schraufstatter expressly limits the scope of "halogen" in the definition of his genus to "chlorine, bromine, and iodine." Thus, appellant's fluoro-substituted compounds are outside Schraufstatter's genus as well as Schraufstatter's sub-genus. Strufe's reference to "[t]he free salicyl anilides" of Schraufstatter similarly limits the disclosure of Strufe to "chlorine, bromine,

and iodine." Furthermore, Strufe as a whole is directed to preparing alkanolamine salts of salicylanilides because, as he states it, free salicylanilides have "several disadvantages in practice." Ioffe I does not mention or suggest the desirability of any fluoro-substituted compounds. In short, the prior art of record provides one of ordinary skill in the art with no motivation to make the proposed molecular modifications needed to arrive at appellant's claimed fluoro-substituted compounds. See *In re Murch*, 59 CCPA 1277, 464 F.2d 1051, 175 USPQ 89 (1972), and *In re Fay*, 52 CCPA 1483, 347 F.2d 597, 146 USPQ 47 (1965). The questions posed by this court in *In re Stemniski*, 58 CCPA 1410, 1416, 444 F.2d 581, 586, 170 USPQ 343, 347 (1971), are also relevant here:

\* \* \* what on this record—other than abstract, theoretical or academic considerations—would lead one of ordinary skill to change the structure of the reference compounds to obtain the claimed compounds? Certainly no practical considerations which promote the progress of useful arts or are of use to society are manifest. How can there be obviousness of structure, or particularly of the subject matter as a whole, when no apparent purpose or result is to be achieved, no reason or motivation to be satisfied, upon modifying the reference compounds' structure? \* \* \*

Since we hold that the prior art of record fails to establish that the fluoro-substituted compounds recited in appellant's claims are *prima facie* obvious, it is unnecessary to consider any comparative evidence with respect to the properties of these compounds.

### ***Chloro-, Bromo-, and Iodo-Substituted Compounds***

With respect to the compounds recited in claims 1 and 2 when Y is chlorine, bromine, or iodine and with respect to the specific compounds recited in claims 3, 4, 5, 7 and 8, we hold that objective comparative evidence of record establishes the non-obviousness of these compounds. *In re Papesch*, 50 CCPA 1084, 315 F.2d 381, 137 USPQ 43 (1963); *In re Wiechert*, 54 CCPA 957, 370 F.2d 927, 152 USPQ 247 (1967); *Commissioner of Patents v. Deutsche Gold-und-Silver-Scheideanstalt Vormal's Roessler*, 397 F.2d 656, 157 USPQ 549 (D.C. Cir. 1968); *National Distillers & Chemical Corp. v. Ladd*, 233 F.Supp. 917, 143 USPQ 59 (D. D.C. 1964).

[3] Since comparative evidence demonstrates that these compounds possess biological activities which are beyond what could reasonably be predicted by the person of ordinary skill in the art, it is unnecessary for us to specifically pass on the issue of whether these compounds are *prima facie* obvious since, even if they are, the *prima facie* case has been overcome by the evidence. *In re Blondel*, 499 F.2d 1311, 182 USPQ 294 (CCPA 1974).

We begin our review of the comparative evidence of record with the claimed compound 3-nitro-4-chlorosalicylanilide (claim 5), which is a non-adjacent position isomer of the prior art compound 5-nitro-4-chlorosalicylanilide disclosed by Schraufstatter, Strufe and Ioffe I. The Howell patent, which was cited by the examiner (although not a prior art reference) and by appellant (to show unexpected properties), indicates in Table V that the claimed compound



produces 100% mortality in sea lamprey larvae at a low concentration of 0.3 parts per million of water. Comparative data for the prior art compound 5-nitro-4-chlorosalicylanilide is found in Howell's Table IV where it is indicated that a higher concentration of 0.5 parts per million is necessary to produce 100% mortality in sea lamprey larvae.

Such an objective difference in the desired toxicity of the claimed compound is unexpected in view of the seemingly minor difference

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in molecular structure, and that difference in toxicity is an empirical fact which could not be reasonably predicted by one of ordinary skill in the art. Hence, the difference in toxicity is persuasive evidence that the claimed compound has non-obvious properties. Since a compound and its properties are inseparable in patent law, *In re Papesch*, supra, " \* \* \* the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would [not] have been obvious at the time the invention was made to a person having ordinary skill in the art \* \* \* ." 35 U.S.C. 103.

Similarly, Howell teaches that 3-nitro-4-bromosalicylanilide (claim 8) produces 100% mortality in sea lamprey larvae at a concentration of 0.3 parts per million while the corresponding compound 5-nitro-4-bromosalicylanilide (not specifically disclosed in the prior art) requires a higher concentration of 0.5 parts per million to produce 100% mortality. Appellant's specification states that 3-nitro-4-iodosalicylanilide (claim 7) produces 100% mortality in sea lamprey larvae at a concentration of 0.3 parts per million while Howell states that the corresponding compound 5-nitro-4-iodosalicylanilide (not specifically disclosed in the prior art) requires a higher concentration of 0.5 parts per million to produce 100% mortality.

Furthermore, Howell states that 3-nitro-3-chlorosalicylanilide (claim 4) produces 100% mortality in sea lamprey larvae at a concentration of 0.3 parts per million while the corresponding compound 5-nitro-3-chlorosalicylanilide (not specifically disclosed in the prior art) requires the higher concentration of 15.0 parts per million to produce 100% mortality.

We conclude that the objective evidence, comparing representative claimed compounds with the corresponding 5-nitro compounds, is sufficient to establish differences which demonstrate the nonobviousness of all of appellant's claimed chloro-, bromo-, and iodo-substituted compounds.

The decision of the board is *reversed*.

### Footnotes

Footnote 1. This application is a continuation-in-part of application serial No. 469,300, filed July 2, 1965, which in turn was a continuation-in-part of application serial No. 325,473, filed November 21, 1963, and application serial No. 435,686, filed February 26, 1965, which were

both filed as continuations-in-part of application serial No. 56,679, filed September 19, 1960.

Footnote 2. The structural formulas in appellant's claims depict the compounds as containing six-membered *aliphatic* rings. However, it is clear from the chemical name 3-nitrohalosalicylanilide that appellant intends to claim compounds which contain six-membered *aromatic* rings. The examiner has advised appellant that he will be required to indicate that the rings in the structural formulas are aromatic.

Footnote 3. The Howell patent (assigned to the United States of America as represented by the Secretary of the Interior) was involved in an interference with Taborsky's application serial No. 539,723, filed April 4, 1966, as a division of application serial No. 469,300, see note 1, *supra*. Taborsky was the successful party. See *Howell v. Taborsky*, 164 USPQ 58 (Bd. Pat. Intf. 1969).

Footnote 4. This patent was granted on application serial No. 539,723, see note 3 *supra*.

**- End of Case -**



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## TRANSMITTAL OF APPEAL BRIEF

Docket No.  
SON-2050

In re Application of: Hisao Hayashi

Application No.  
09/808,957-Conf. #5303

Filing Date  
March 16, 2001

Examiner  
M. Lewis

Group Art Unit  
2822

Invention: THIN FILM SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREOF

### TO THE COMMISSIONER OF PATENTS:

Transmitted herewith is the Appeal Brief in this application, with respect to the Notice of Appeal filed: November 29, 2004

The fee for filing this Appeal Brief is \$ 500.00

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☐ A petition for extension of time is also enclosed.

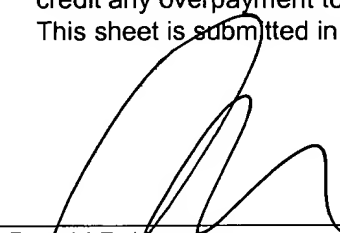
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Dated: January 31, 2005